Report on the shopping behaviour of online food hub customers

Mark Wilson

Research conducted: Autumn 2020

Report date: January 2021

Project name: SILCI – Social Influence and Disruptive Low Carbon Innovations

Supported by ERC Starting Grant #678799

Contact: mark.wilson@uea.ac.uk

Summary

This report is based on the monthly Open Food Network shopping baskets of 94 anonymised hub users over 4 non-consecutive months: Sep-19, Feb-20, May-20, Sep-20. All of these users have been buying from their respective hub for at least a year and so represent loyal customers. Four aspects of their shopping behaviour are summarised below.

Expenditure

- Average expenditure almost doubled in May-20, relative to Sep-19, which suggests a clear short-term ‘pandemic effect’ on shopping behaviour
- Average expenditure was at least 32% higher in Sep-20, relative to Sep-19. This may indicate a longer-term expenditure increase among regular hub customers

Order frequency

- Average order frequency peaked in May-20, which can also be attributed to the pandemic
- The majority of hub users ordered more frequently in Sep-20 than in Sep-19. This increase in order frequency, together with the expenditure increase, could indicate a greater reliance on their local hub for their food shopping

Purchasing trends

- Sales increased notably over the 4 months of the following foods:
    - fresh vegetables; dairy products; soya products; meat; basic cupboard stock; nuts, seeds & dried fruit; juices & soft drinks; preserves, sauces & spreads
- Fresh fruit & veg and dairy products comprise the bulk of the hub basket for all expenditure levels. Other foods such as baked goods become more important as expenditure increases

Comparing the food hub basket with the average UK shopping basket

- Hubs users buy a <u>large proportion</u> (more than 50% of the average UK weekly purchase) of the following foods from their local hub:
    - fresh vegetables, butter, non-dairy milk substitutes, canned tomatoes, flour, oats and oat products, nut butter, soya & novel proteins, quiche, dried vegetables, stock & yeast, vegetable purees
- Hub users buy a <u>medium proportion</u> (25-49% of the average UK weekly purchase) of the following foods from their local hub:
    - milk & cream, cheese, fish, canned pulses, canned vegetables, honey, cocoa, dried pulses, pickles, salt, savoury snacks, unsweetened biscuits

Contents

Method

Sections 1-3 explore how food hub shopping habits have changed over 4 non-consecutive months: Sep-19, Feb-20, May-20, Sep-20. Mean, standard deviation and percentage change were used to investigate trends in expenditure, order frequency and basket composition. This information was explored at two levels: 'overall' is all of the customers from the two hubs combined (Glasgow Locavore n=51, Tamar Valley Food Hubs n=43); 'groups' is the same analysis conducted using lower, middle and upper expenditure groups within each hub. The groups were determined using the mean monthly expenditure percentiles for each hub (lower: 1-33%, middle: 34-67%, upper: 68-100%). Section 4 contextualises food hub shopping within broader shopping behaviour by comparing the average OFN shopping basket with the average UK shopping basket, using the weight/volumes of various foods and drinks purchased per person per week. All of the analysis was conducted in Excel.

1.0 Expenditure

This section presents changes in monthly expenditure over the 4 months.

1.1 Overall expenditure

Tamar customers spend 3.75 times more than Locavore customers on their monthly hub shop (see *Table 1* below), which can be partially explained by Tamar's wider range of products, but also by the two hubs' different business models. Locavore run a veg-box scheme separately (which is not shown in the OFN data set), whereby customers can buy items from the Locavore OFN shop only if they have already ordered a veg box that week. Locavore expenditure therefore represents purchases *in addition to* fresh fruit and veg, whereas Tamar expenditure is for all purchases.

Table 1, Mean monthly expenditure (£) for Tamar and Locavore customers

	Sep-19	Feb-20	May-20	Sep-20
Locavore	23.21	24.27	58.09	37.18
Tamar	110.03	79.98	199.45	145.36

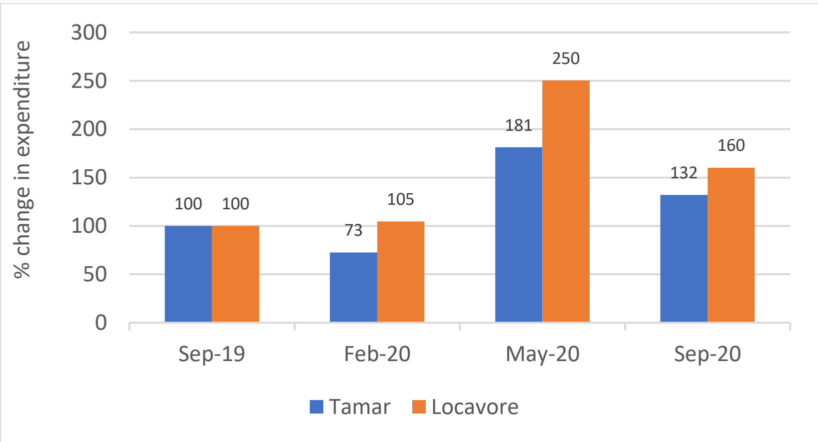


Figure 1, percentage change in mean monthly expenditure for Tamar and Locavore customers

Figure 1 shows the % change in monthly expenditure, relative to the Sep-19 baseline of 100. Customers from both hubs show a sharp increase in monthly expenditure in May-20, suggesting a clear pandemic effect on their shopping behaviour. Although Sep-20 monthly expenditure decreased from May levels, the average shopping basket remained larger than the pre-pandemic average. Tamar customers' average monthly expenditure in Sep-20 was 32% higher, and Locavore customers' 60% higher, relative to Sep-19.

Variation in overall expenditure

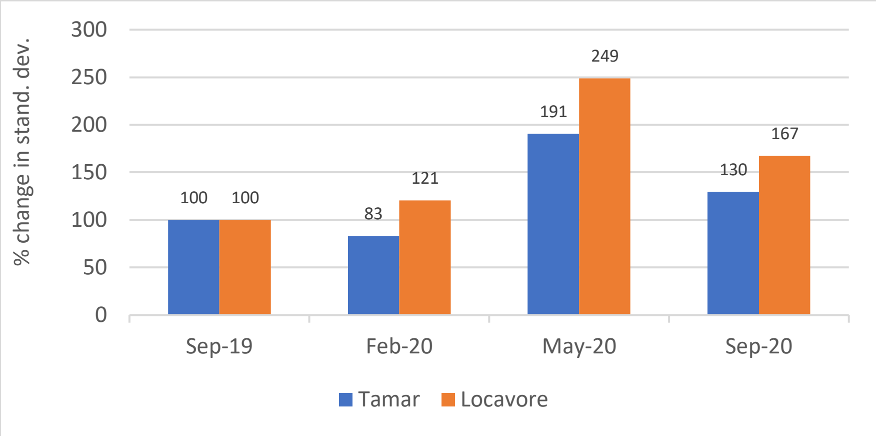


Figure 2, percentage change in expenditure standard deviation for Tamar and Locavore customers

Figure 2 shows the variation in shopping basket expenditure approximately doubled for both Tamar and Locavore in May-20, relative to the baseline of Sep-19. Variation then decreased in Sep-20 but remained 30% higher for Tamar and 67% higher for Locavore, relative to Sep-19.

From *Figures 1* and *2* we can infer that as customers' mean expenditure increases, the variation in their shopping basket sizes also increases. Thus, some customers spend a lot more, whereas others only spend a bit more, resulting in a wider spread of data.

Finally, there is greater variation in monthly expenditure for Locavore customers than for Tamar customers.

1.2 Groups' expenditure

This section summarises the changes in expenditure over the 4 months for the lower, middle and upper expenditure groups.

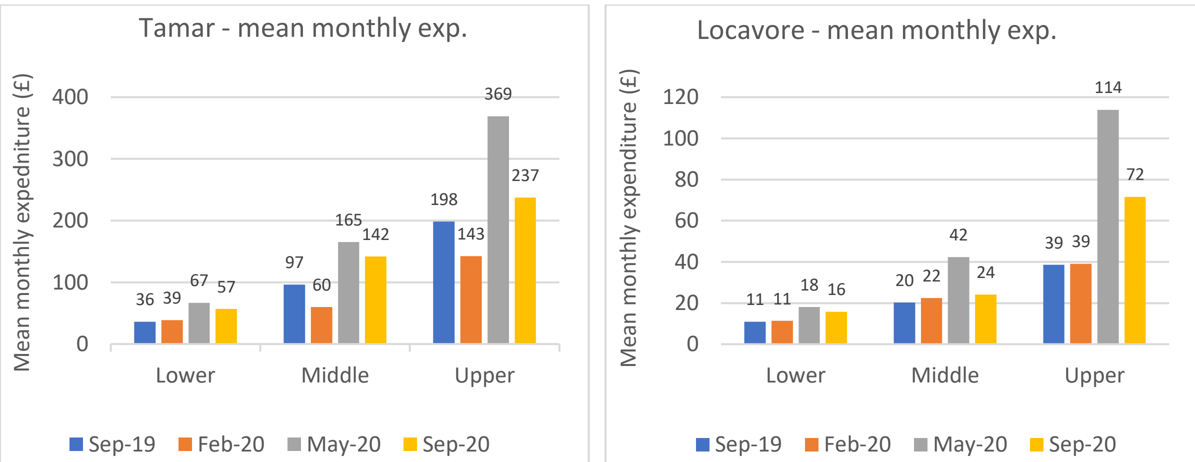


Figure 3, mean monthly expenditure (£) for lower, middle and upper expenditure customers (note - the y axis scales differ)

Figure 3 shows a marginal increase in expenditure in Feb-20 or, in the case of Tamar middle and upper expenditure groups, a decrease. All groups significantly increased their expenditure in May-20, most notably the two upper groups. Mean expenditure in Sep-20 remained above the Sep-19 baseline for all groups, with the most pronounced increases being Locavore upper (+86%) and lower (+45%), as well as Tamar lower (+57%) and middle (+47%).

Variation in groups' expenditure

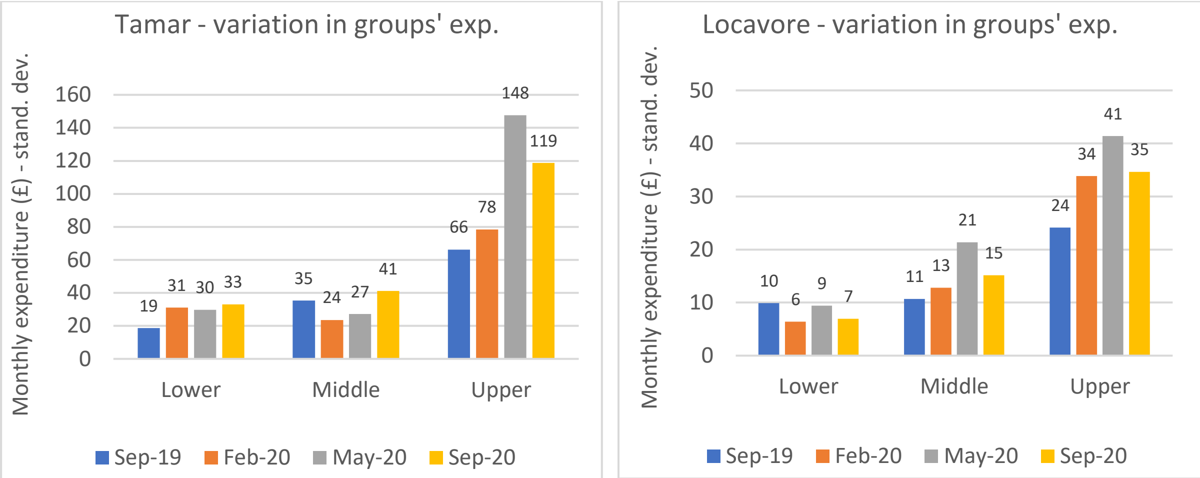


Figure 4, monthly expenditure (£) standard deviation for lower, middle and upper expenditure customers

Three groups were relatively homogenous in their monthly expenditure over the 4 months: Tamar lower and middle, as well as the Locavore lower group. The two upper groups and the Locavore middle group displayed more variation in their shopping basket expenditure, with standard deviations increasing noticeably in May-20.

2.0 Order frequency

This section presents changes in order frequency over the 4 months.

2.1 Overall order frequency

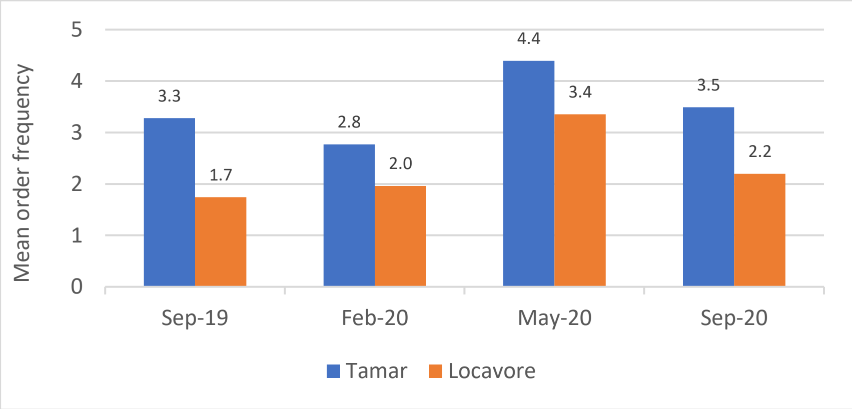


Figure 5, mean monthly order frequency for Tamar and Locavore customers

Figure 5 shows that Tamar customers consistently ordered more often than Locavore customers. Both Tamar and Locavore customers ordered more frequently in Sept-20 than in Sept-19 or Feb-20. Both hubs experienced a spike in order frequency in May-20. Even accounting for May-20 having 5 order cycles rather than 4, there still appears to have been a clear pandemic effect on order frequency in May.

<u>Variation in overall order frequency</u>

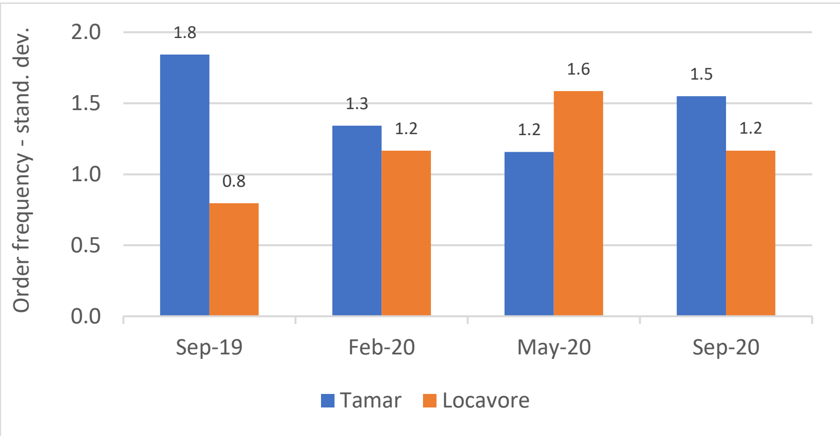


Figure 6, order frequency standard deviation for Tamar and Locavore customers

Locavore customers were fairly homogenous in terms of order frequency in Sep-19 with a standard deviation of 0.8, but variation increased steadily in both Feb-20 and May-20, before decreasing in Sep-20. In contrast, Tamar customers were relatively heterogenous in order frequency in Sep-19. However, they became increasingly similar in their ordering behaviour, particularly in May-20 when the majority of customers placed the maximum of 5 orders per month.

2.2 Groups' order frequency

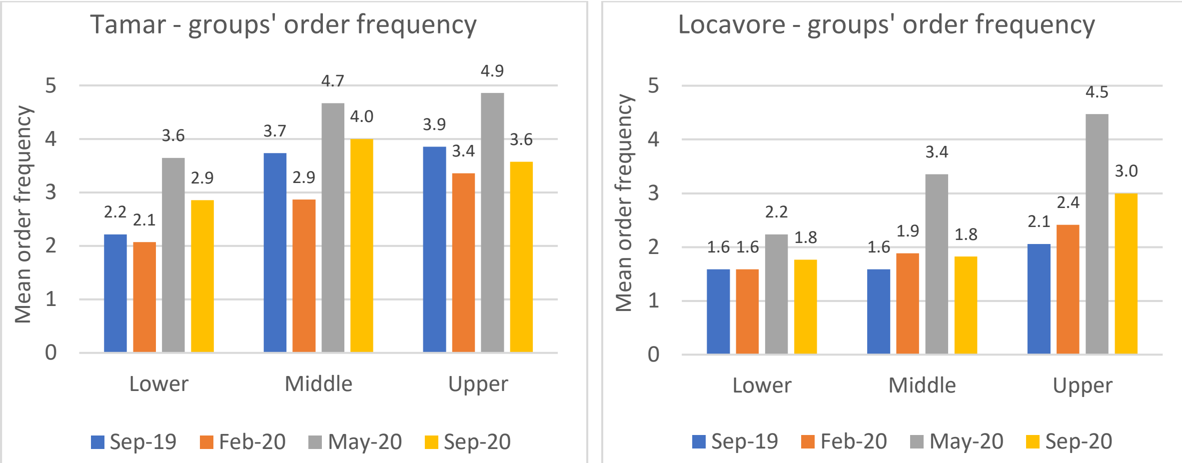


Figure 7, mean monthly order frequency for lower, middle and upper expenditure customers

Figure 7 shows upper expenditure customers tend to order most frequently and lower expenditure customers order least frequently. With the exception of the Tamar upper group, all groups ordered more frequently in Sep-20 than in Sep-19. One difference between the hubs is that the three Tamar groups ordered less frequently in Feb-20, whereas the three Locavore groups stayed constant or increased order frequency in Feb-20. A decrease in orders in February could be attributed to the hungry gap/reduced availability of fresh produce, but it is unclear why this would occur only for one of the two hubs.

Variation in groups' order frequency

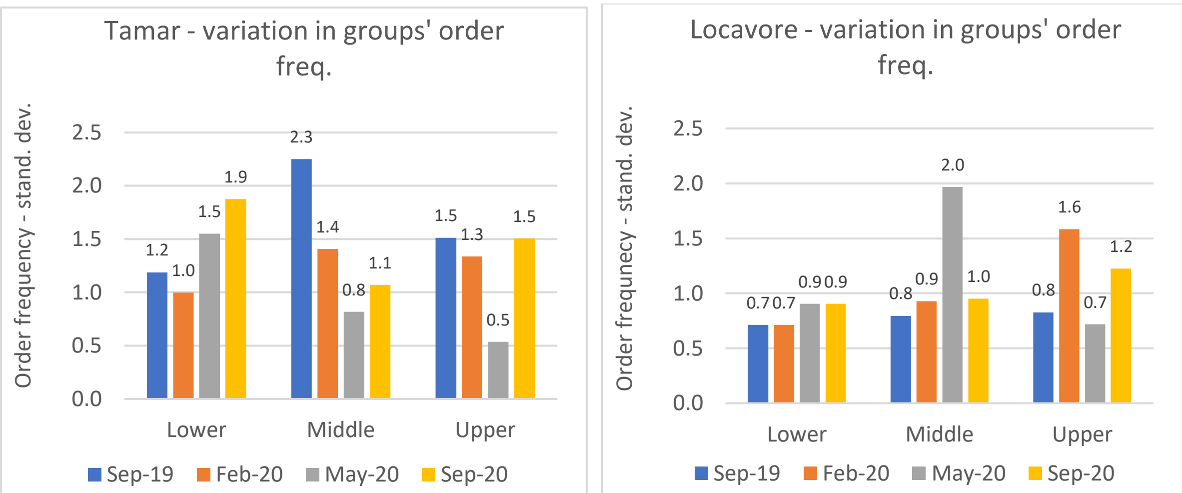


Figure 8, order frequency standard deviation for lower, middle and upper expenditure customers

There is no clear pattern for the analogous groups across the two hubs. All three Tamar groups became more homogenous in their ordering frequency in Feb-20, and the middle and upper groups continued this trend in May-20. Variation then increased in all 3 groups in Sep-20. The Locavore lower group is relatively homogenous across all 4 months, as is the middle group with the exception of May-20.

3.0 The food hub shopping basket

This section presents trends in food purchases over the 4 months at the overall and the group level. The food hub basket composition is described in section 3.2.

3.1 Purchasing trends

Trends in 25 food categories are presented below. Some of OFN's existing food categories were disaggregated to provide a more detailed picture of the purchasing trends and some items were recoded to ensure consistency across the two hubs. The graphs use the number of items bought in a given month to show purchasing trends.

Fresh fruit & veg

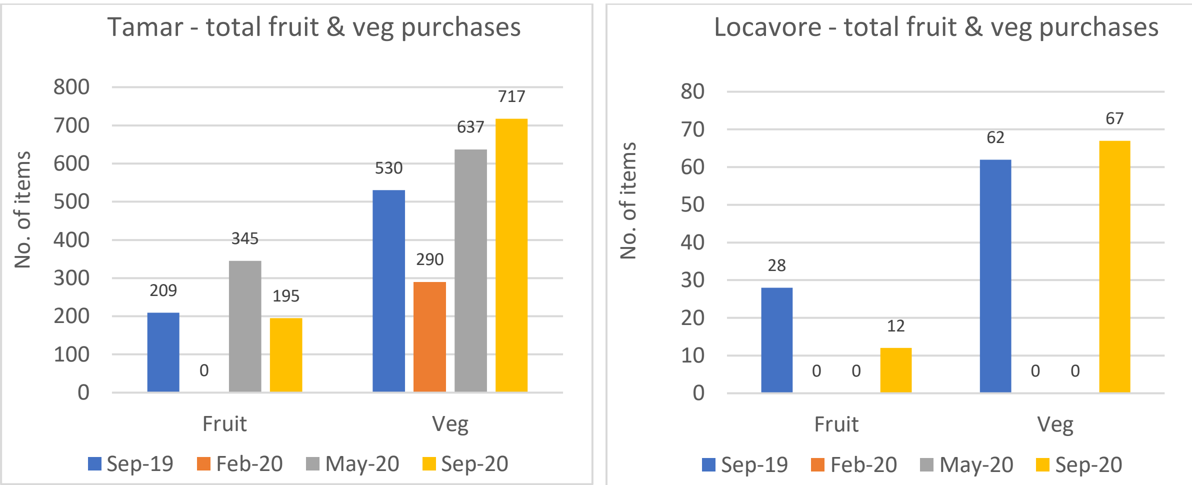


Figure 9, fruit & veg - number of items bought each month by Tamar and Locavore customers (note – different scales on y axis)

Figure 9 shows that sales of fruit were relatively consistent, whereas veg sales increased. Locavore operates a veg box scheme separately and so *Figure 9* comprises of optional fruit and veg 'add-ons'. There was apparently no additional fruit or veg for sale in Feb-20 or May-20 at Locavore. Tamar sells small fruit bags (10 items) and small veg bags (4 or 5 items); these are coded as single items in *Figure 9*.

Fresh fruit

Tamar sales of fruit peaked in May-20, but Sep-19 and Sep-20 levels were similar. Locavore sales in Sep-20 were less than half the Sep-19 levels, which can be explained by a very limited range in Sep-20. Most of the fruit sold by Tamar is locally produced (apples, strawberries, raspberries, grapes) whereas the 'add-on' fruits sold by Locavore (bananas, kiwis, lemons) are imported.

Fresh vegetables

Tamar sales dipped sharply in Feb-20, likely reflecting the limited range available in Spring, before rising in May-20. Sep-20 sales were 35% higher than Sep-19. Locavore sales in Sep-19 and Sep-20 were similar.

<u>**Groups' purchasing trends – fruit & veg**</u>

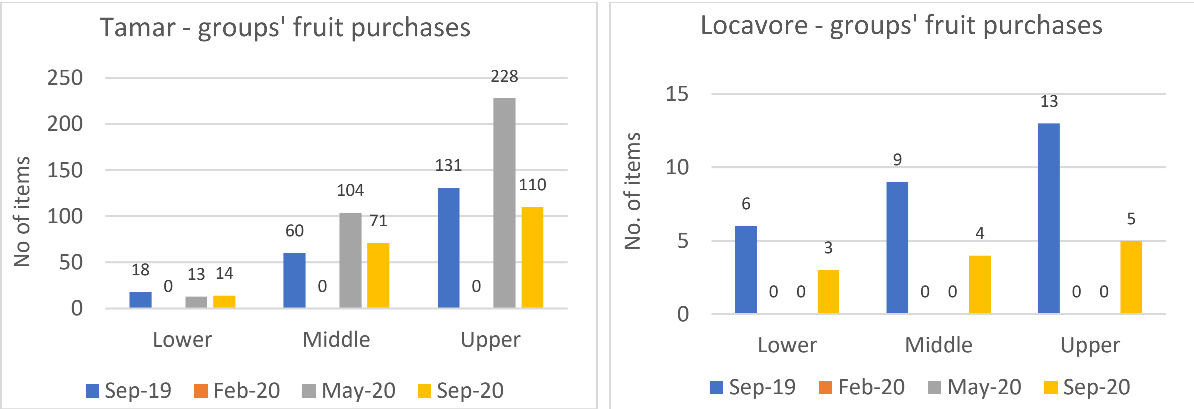


Figure 10, fruit - number of items bought each month by lower, middle, and upper expenditure customers (note – different scales on y axis)

Figure 10 shows fruit purchases each month by the lower, middle, and upper expenditure groups. It is difficult to identify clear findings from these graphs as fruit was not available in Feb-20 or May-20 for Locavore customers, and likewise Feb-20 for Tamar customers.

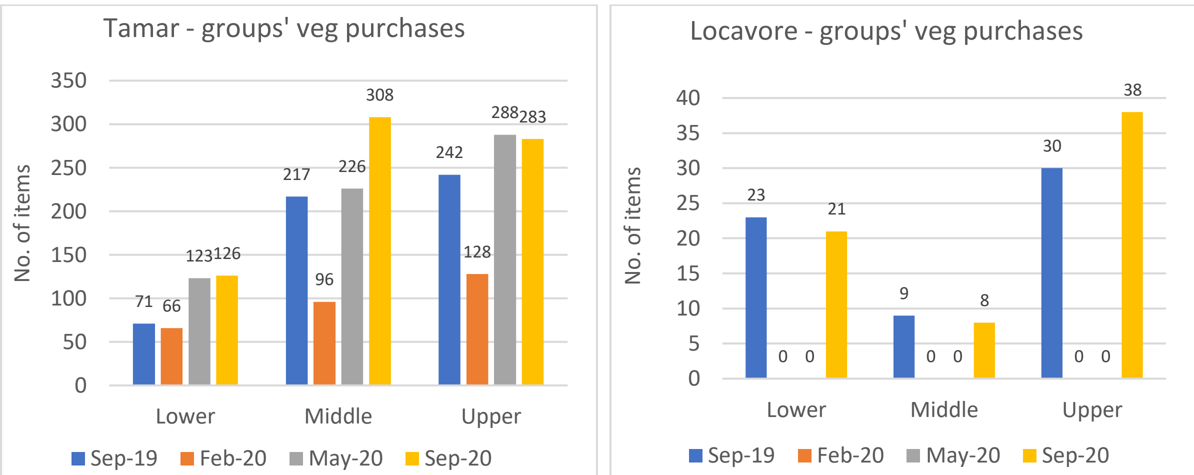
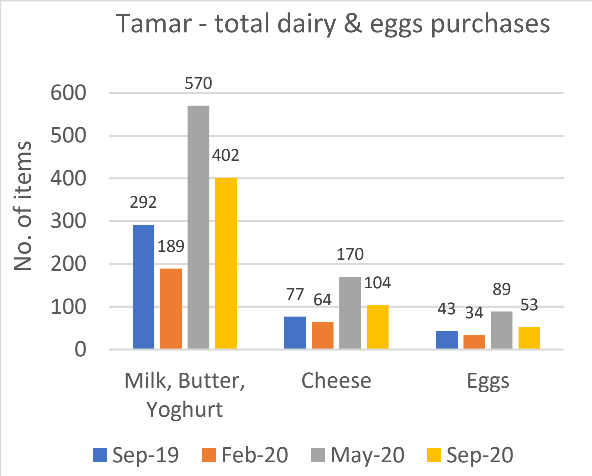


Figure 11, veg - number of items bought each month by lower, middle, and upper expenditure customers (note – different scales on y axis)

Figure 11 shows Tamar veg purchases increased for all 3 groups over the 4 months. As with fruit, it is difficult to ascertain clear results for Locavore because veg add-ons were not available in Feb-20 or May-20.

Dairy & eggs



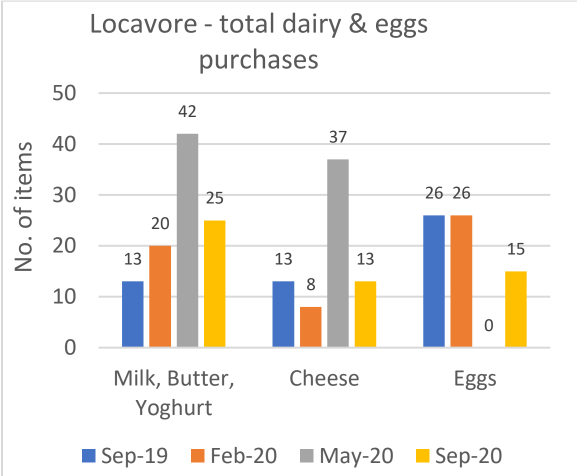


Figure 12, dairy & eggs - number of items bought each month by Tamar and Locavore customers (note – different scales on y axis)

Figure 12 shows that sales of dairy products increased, irrespective of the clear spike in May-20. Sales of eggs were fairly consistent over the 4 months.

Milk, butter, yoghurt

Both Tamar and Locavore experienced a marked increase in May-20, before decreasing in Sep-20 but remained 38% higher (Tamar) and 92% higher (Locavore) than Sep-19 levels. Tamar dairy sales were approximately 14 times that of Locavore's. Both hubs sell butter and yoghurt, and Tamar also sells milk and cream. Locavore sells soya yoghurt (not shown in *Figure 10*), for which sales were steady for the first 3 months but then doubled in Sep-20.

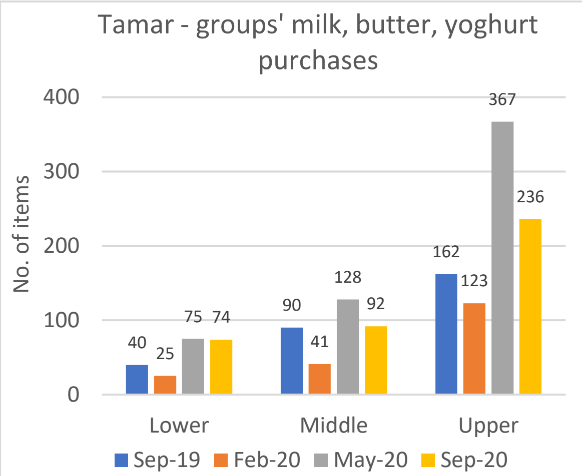
Cheese

Tamar sales dipped in Feb-20 but then doubled in May-20. Sales in Sep-20 were 35% higher than Sep-19. Locavore sales were fairly consistent, although demand tripled in May-20. Tamar sells a much wider range of cheeses than Locavore.

Eggs

Sales of eggs were consistent in Sep-19 and Feb-20 for both hubs. Tamar sales doubled in May-20 and were 23% higher in Sep-20 compared to Sep-19. Locavore sales dropped to zero in May-20 (eggs may not have been sold on their OFN shop in May) and were 42% lower in Sep-20 relative to Sep-19.

Groups' purchasing trends – dairy & eggs



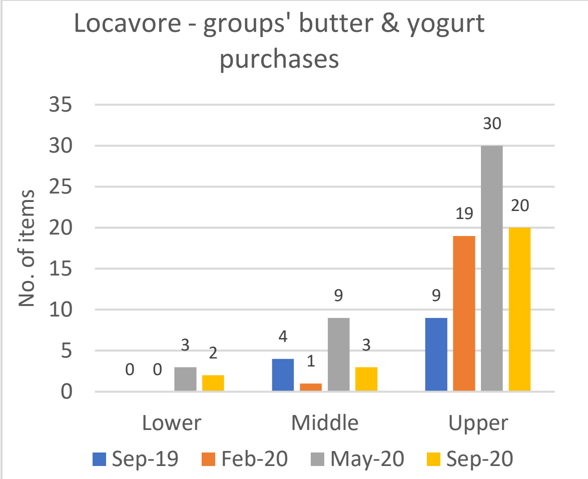
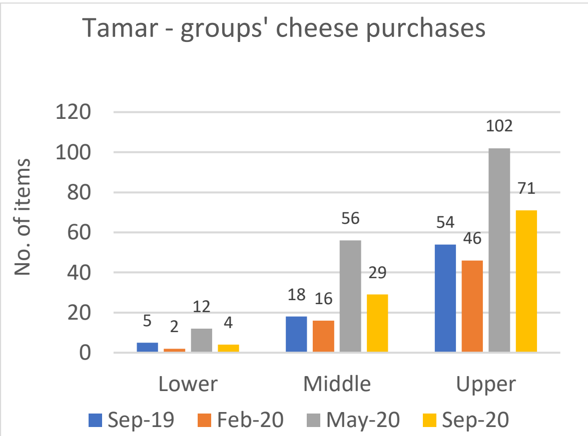


Figure 13, milk, butter, yoghurt - number of items bought each month by lower, middle, and upper expenditure customers (note – different scales on y axis)

Figure 13 shows that demand for milk, butter and yoghurt increased across all 3 groups for both hubs, in particular the lower and upper expenditure groups.



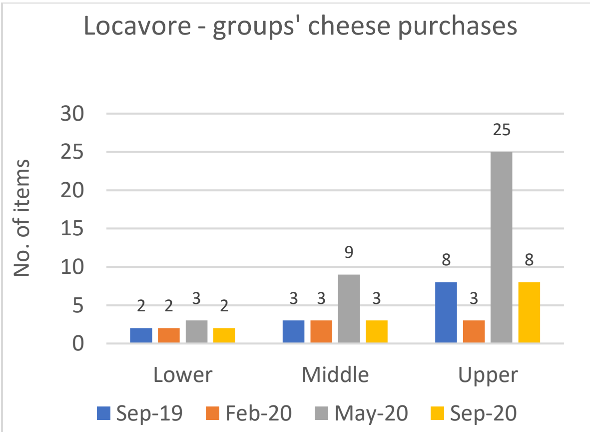


Figure 14, cheese - number of items bought each month by lower, middle, and upper expenditure customers (note – different scales on y axis)

Figure 14 shows Tamar sales of cheese increased for the middle and upper expenditure groups. Locavore sales of cheese were fairly consistent for all groups, excepting the May-20 spike.

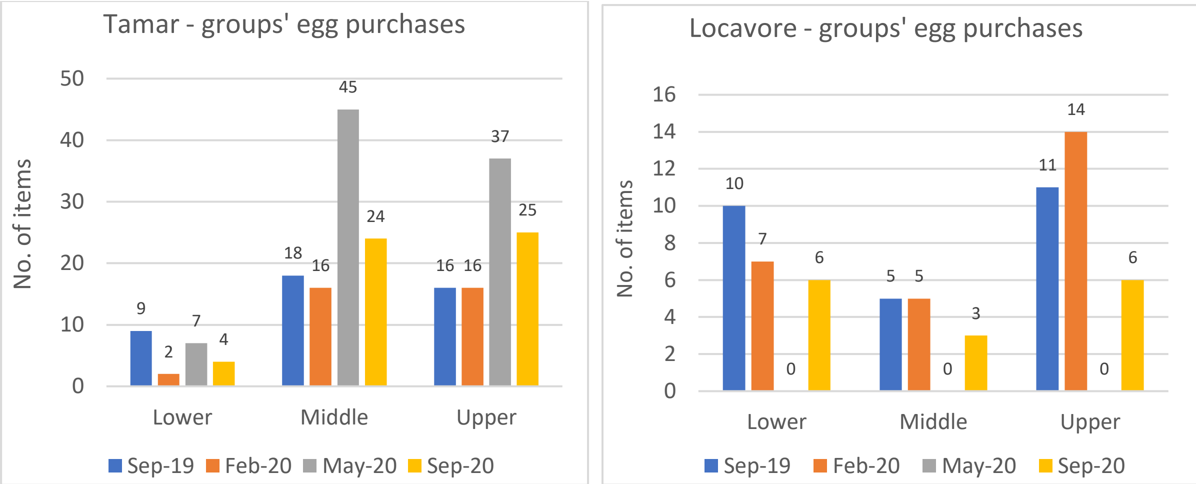
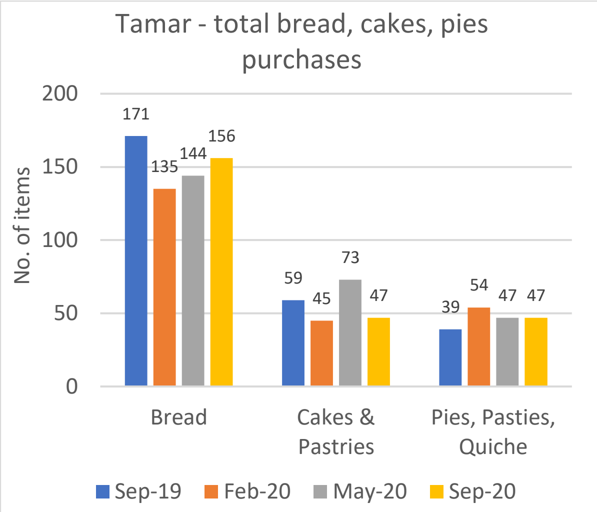


Figure 15, eggs - number of items bought each month by lower, middle, and upper expenditure customers (note – different scales on y axis)

Figure 15 shows Tamar sales of eggs increased for the middle and upper groups. Locavore sales decreased for all groups in Sep-20, but this may be related to limited availability rather than demand.

Bread, cakes, pies



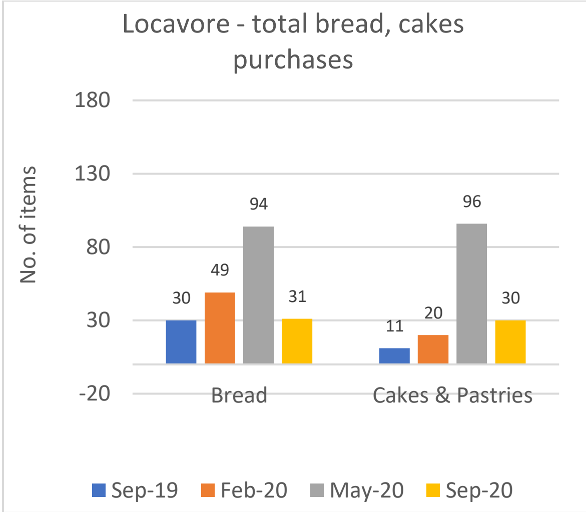


Figure 16, bread, cakes, pies - number of items bought each month by Tamar and Locavore customers

Figure 16 shows that sales of bread and pies & pasties were fairly consistent, whereas sales of cakes & pastries fluctuated.

Bread

No significant change in demand, with the exception of a large increase for Locavore in May-20. Tamar sales were approximately 3 times those of Locavore's. Both hubs offer a wide range of breads.

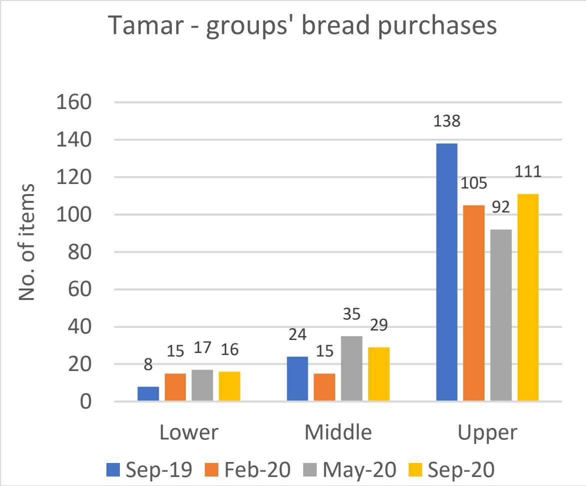
Cakes & pastries

Tamar sales were fairly constant over the 4 months. Locavore sales, however, were 173% higher in Sep-20 compared to Sep-19. Locavore in particular experienced a spike in May-20. Both hubs offer a wide range of cakes and pastries.

Pies, pasties, quiche

Tamar sales were reasonably consistent. Locavore do not sell these products.

Groups' purchasing trends – bread, cakes, pies



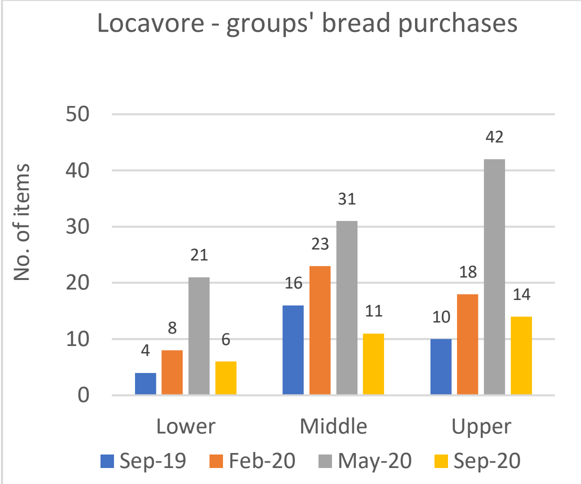
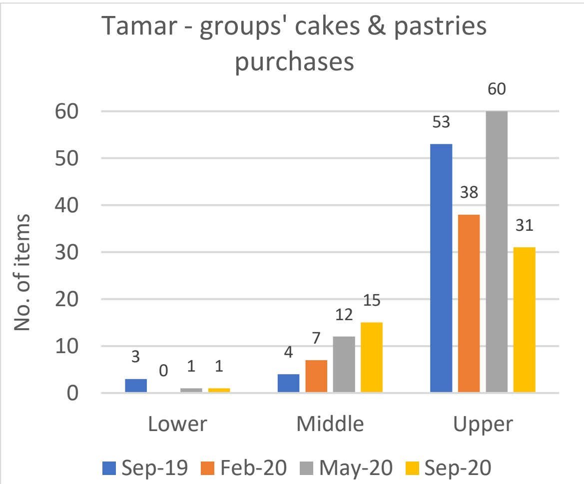


Figure 17, bread - number of items bought each month by lower, middle, and upper expenditure customers (note – different scales on y axis)

Figure 17 shows bread sales were fairly consistent for all 3 Tamar groups. Locavore sales increased for all 3 groups until Sep-20, when there was a sharp decrease.



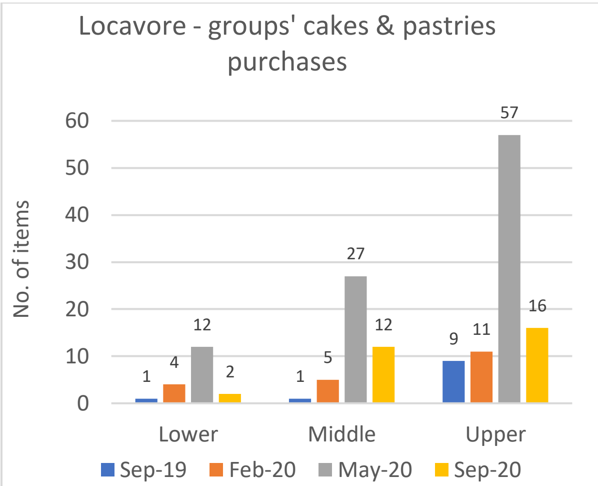


Figure 18, cakes and pastries - number of items bought each month by lower, middle, and upper expenditure customers

Figure 18 shows that sales of cakes & pastries increased for both of the middle expenditure groups and for the Locavore upper group. The Tamar upper group bought proportionally more cakes & pastries, but this appears to have progressively decreased over the 4 months.

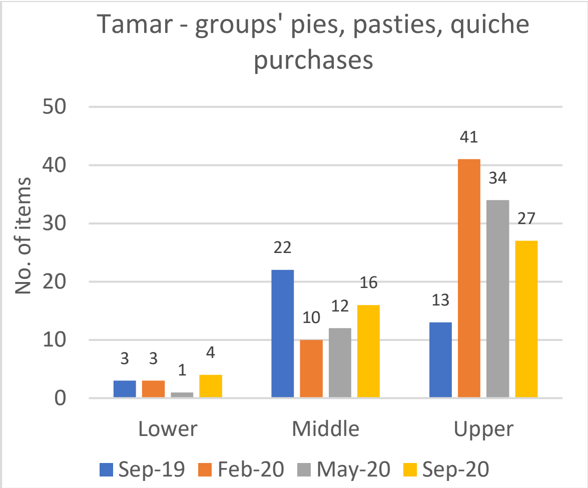


Figure 19, pies, pasties, quiche - number of items bought each month by lower, middle, and upper expenditure customers

Figure 19 shows that Tamar sales of pies, pasties and quiche were consistent for the lower group. Sales gradually increased for middle group but decreased for the upper group.

Meal basics

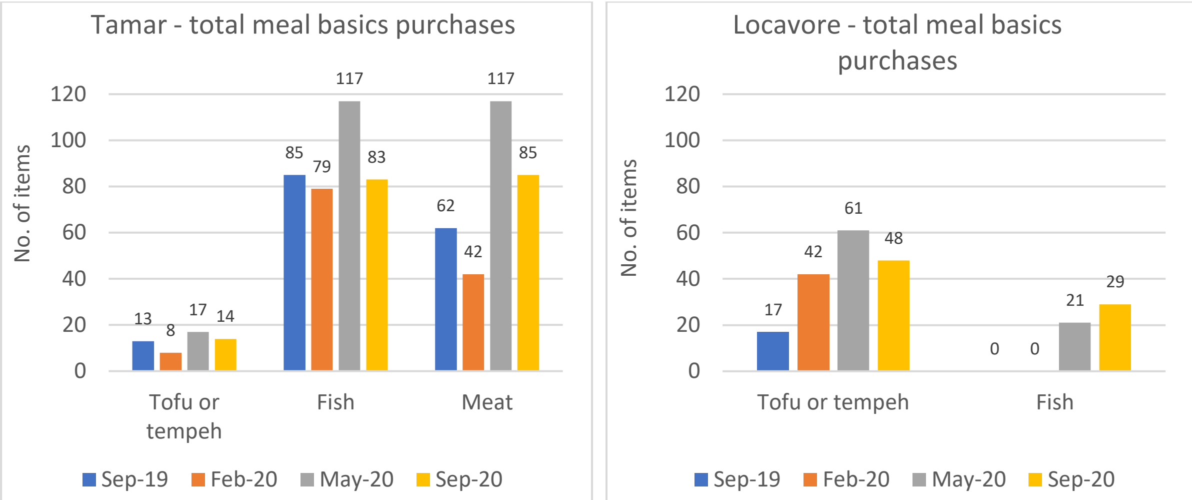


Figure 20, meal basics - number of items bought each month by Tamar and Locavore customers

Figure 20 shows that sales of meat and soya products increased. Demand for fresh fish was consistent but increased for tinned fish.

Tofu and tempeh

Tamar sales were fairly consistent, but Locavore sales almost tripled from Sep-19 to Sep-20. Locavore sales were more than 3 times Tamar's sales.

Fish

Tamar sales were consistent, aside from the peak in May-20. Locavore appears to have started selling canned fish in May-20 and demand increased in Sep-20 by 38%. Tamar sells fresh fish: catch of the day (various), salmon, smoked salmon, pilchards, scallops. Locavore sells canned fish: tuna, sardines, mackerel (all in olive oil).

Meat

Tamar sales dipped in Feb-20 but then almost tripled in May-20. Sep-20 sales were 37% higher than Sep-19. Tamar sells: Pork (chops, bacon, sausages, ribs, roasting joint), Beef (steak, mince, chunks, roasting joint, burgers, oxtail, ox tongue), Chicken, Lamb, Goat. Locavore does not sell meat.

Groups' purchasing trends – meal basics

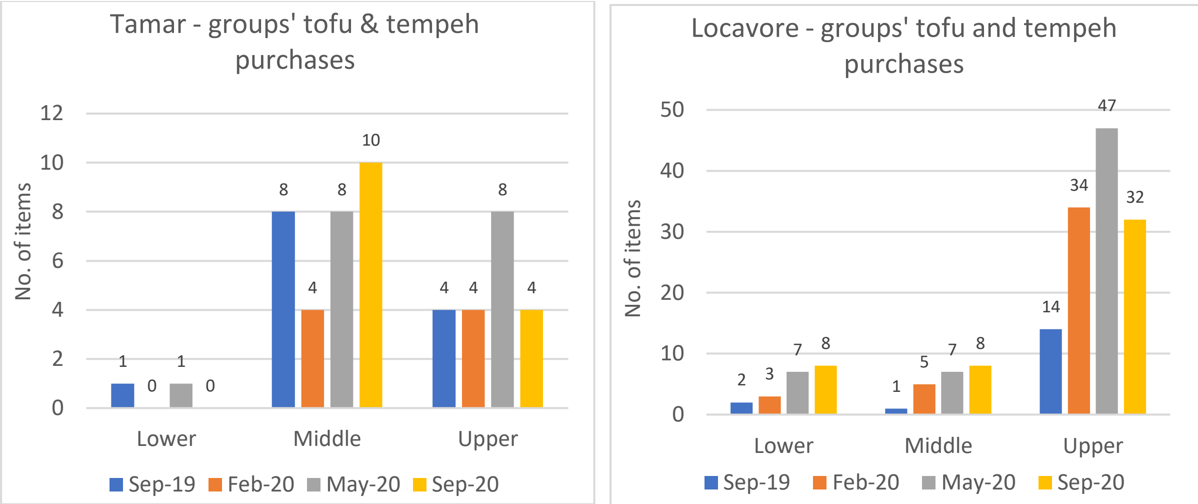


Figure 21, tofu & tempeh - number of items bought each month by lower, middle, and upper expenditure customers (note – different scales on y axis)

Figure 21 shows that Locavore sales of tofu and tempeh increased for all 3 groups, whereas Tamar sales were fairly consistent. The Tamar middle group and Locavore upper group bought proportionally more soya-based products than the other groups.

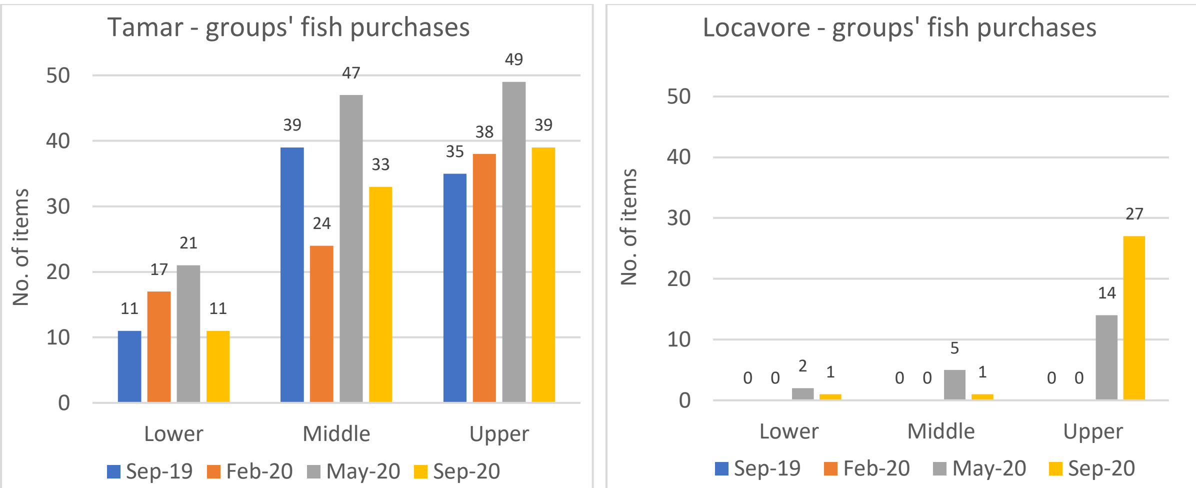


Figure 22, fish - number of items bought each month by lower, middle, and upper expenditure customers

Figure 22 shows that Tamar lower and middle groups bought proportionally more fish, relative to the upper group. All 3 groups reduced their purchases of fish in Sep-20. No clear findings can be drawn from the Locavore graph.

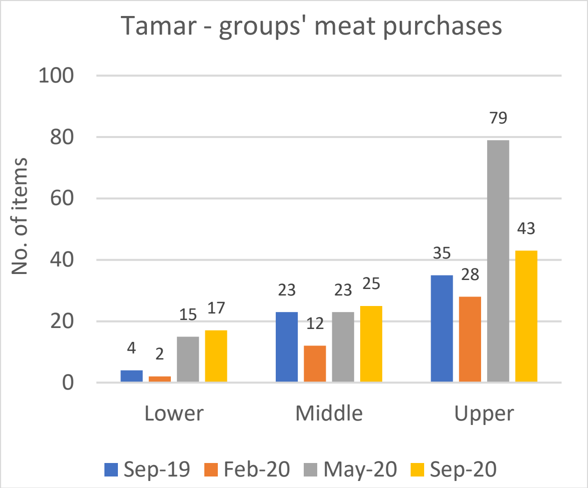


Figure 23, meat - number of items bought each month by lower, middle, and upper expenditure customers

Figure 23 shows that Tamar sales of meat increased for the lower and upper expenditure groups but remained constant for the middle group.

Cupboard stock

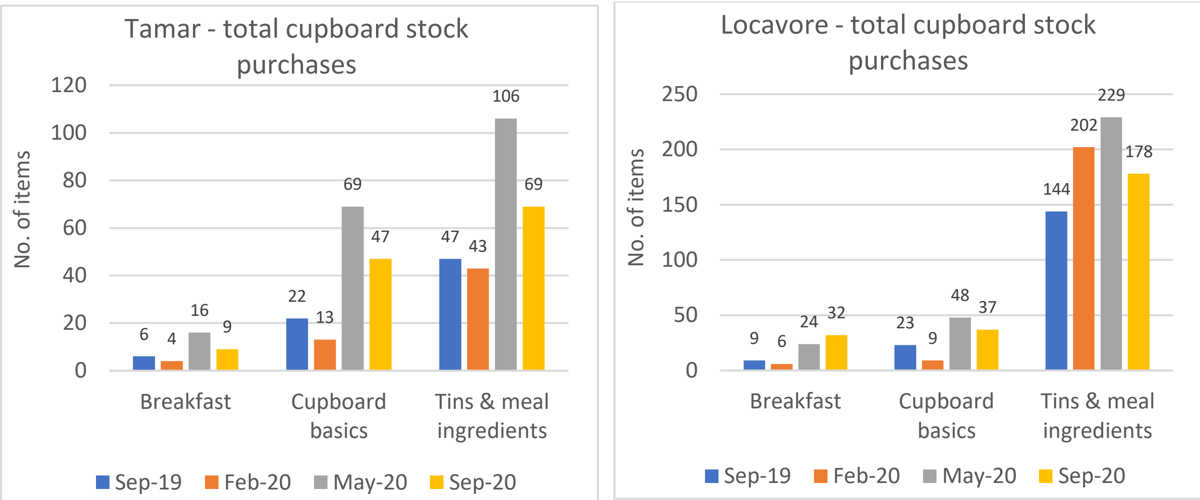


Figure 24, cupboard stock - number of items bought each month by Tamar and Locavore customers (note – different scales on y axis)

Figure 24 shows that sales increased in all three cupboard stock categories over the 4 month.

Breakfast items

Breakfast purchases increased for both hubs; Tamar sales were 50% higher in Sep-20 relative to Sep-19, and Locavore's were 256% higher. This includes: cereals, granola, muesli, oats.

Cupboard basics

Both hubs experienced a peak in demand in May-20. Compared to the Sep-19 baseline, Tamar sales in Sep-20 more than doubled and Locavore's increased by 61%. This includes: pasta, noodles, rice, flour, sugar. Tamar also sells spelt, buckwheat, cous cous and quinoa.

Tins & meal ingredients

Both hubs experienced a peak in May-20. Compared to the Sep-19 baseline, Tamar sales in Sep-20 increased by 47% and Locavore's by 24%. This includes: pulses, yeast, sausage mix, falafel mix, passata, pesto, dried mushrooms. Tins of chopped tomatoes, coconut milk, beans. Locavore also sells peas and dahl.

Groups' purchasing trends - cupboard stock

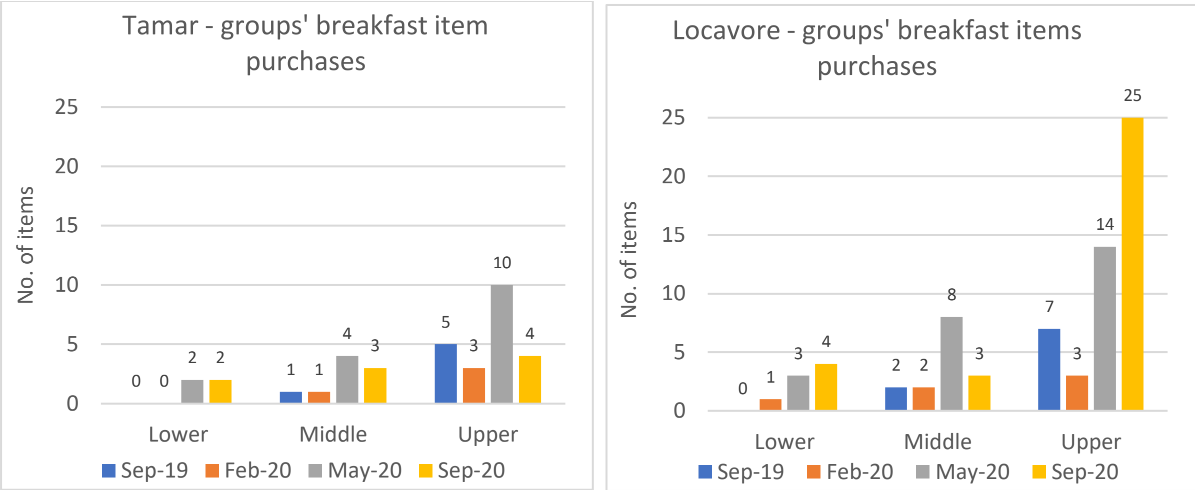


Figure 25, breakfast - number of items bought each month by lower, middle, and upper expenditure customers

Figure 25 shows that sales of breakfast products increased for both of the lower expenditure groups and in particular for the Locavore upper group.

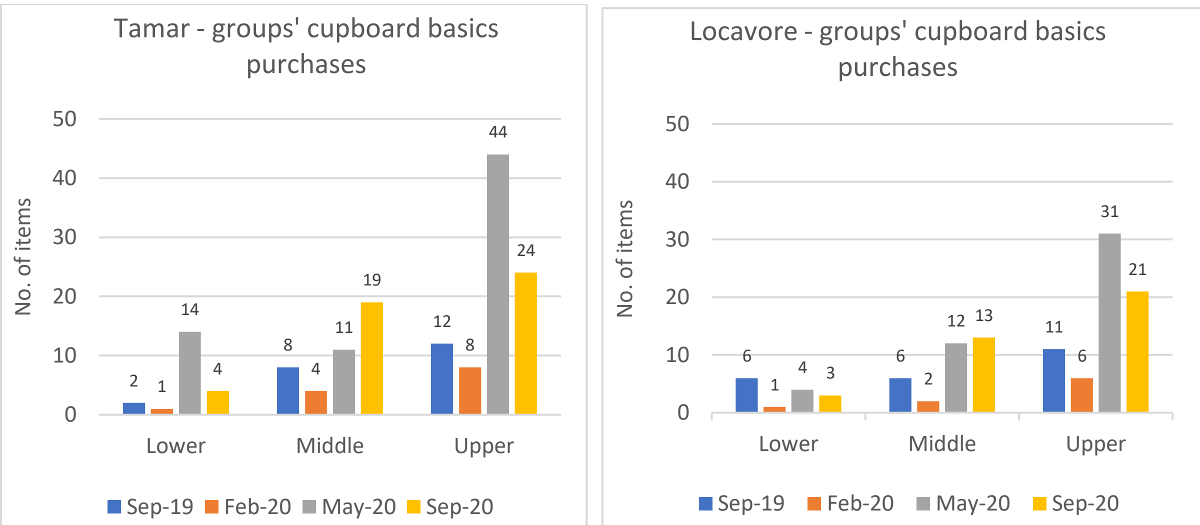


Figure 26, cupboard basics - number of items bought each month by lower, middle, and upper expenditure customers

Figure 26 shows that sales of basic items for the cupboard increased for the middle and upper groups of both hubs.

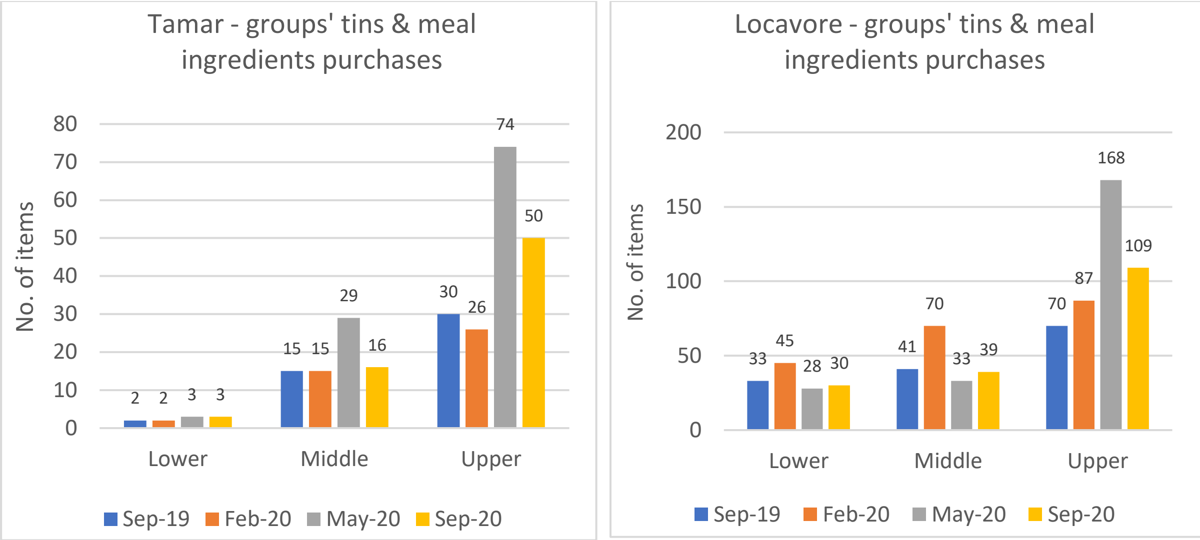
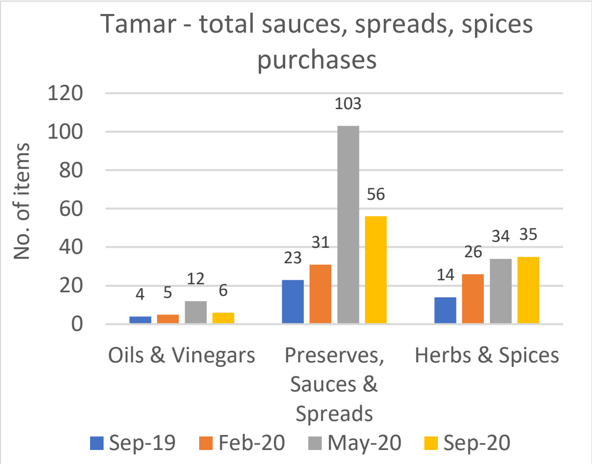


Figure 27, tins & meal ingredients - number of items bought each month by lower, middle, and upper expenditure customers (note – different scales on y axis)

Figure 27 shows that sales of tins and meal ingredients increased for both of the upper expenditure groups but were relatively consistent for the lower and middle groups.

Sauces, spreads, spices



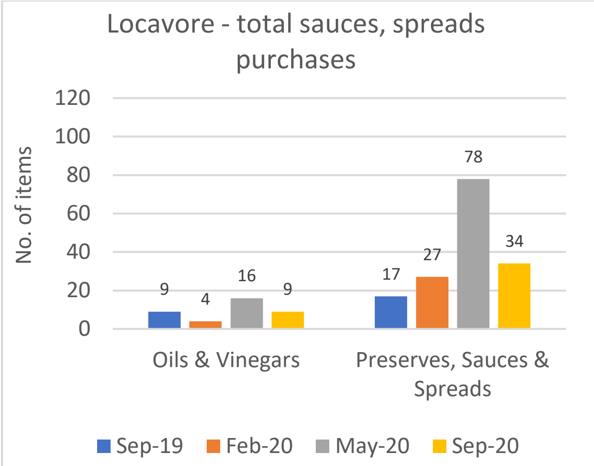


Figure 28, sauces, spreads, spices - number of items bought each month by Tamar and Locavore customers

Figure 28 shows that demand increased for preserves, sauces and spreads, as well as for herbs and spices.

Oils & vinegars
No significant change over the 4 months. This includes: olive oil and coconut oil; Tamar also sells rapeseed oil and vinegar.

Preserves, sauces and spreads
Irrespective of the May-20 spike, sales of these products increased steadily. Locavore sales doubled and Tamar's were 143% higher in Sep-20, relative to Sep-19. This includes: jams, chutneys, peanut butter, tomato sauce, pickles, honey, chocolate spread, tahini, soya sauce. Locavore has a more limited range but also sells hummus and olives.

Herbs and Spices
Tamar sales increased incrementally over the 4 months. Sep-20 sales were more than double those of Sep-19. This includes: sea salt, dried herbs & spices, pepper, veg bouillon. Locavore do not sell these items.

Groups' purchasing trends - sauces, spreads, spices

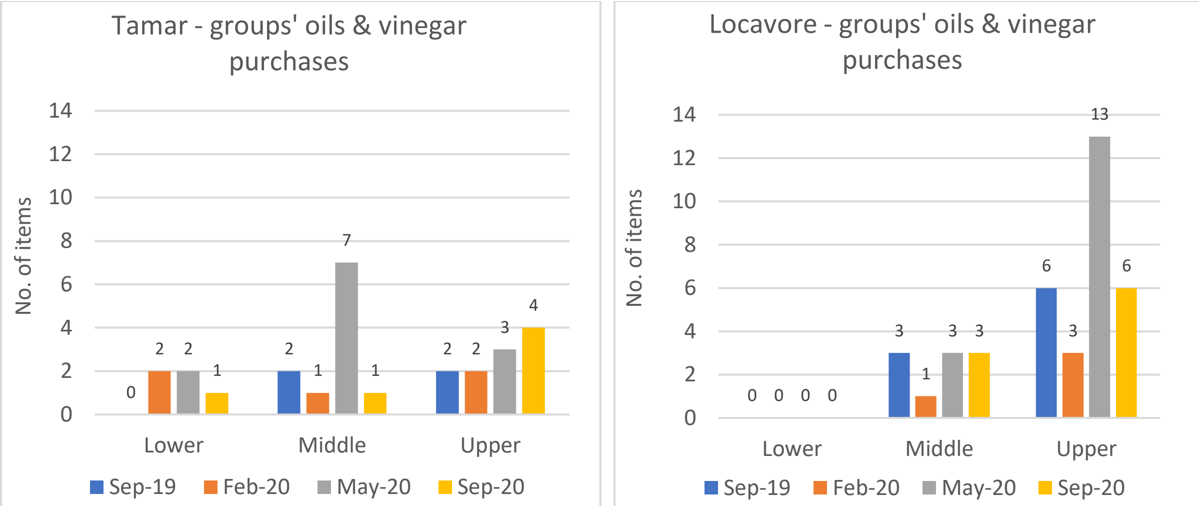


Figure 29, oils & vinegars - number of items bought each month by lower, middle, and upper expenditure customers

Figure 29 shows sales of oils and vinegars were fairly consistent across all groups, excepting the clear spike in May-20.

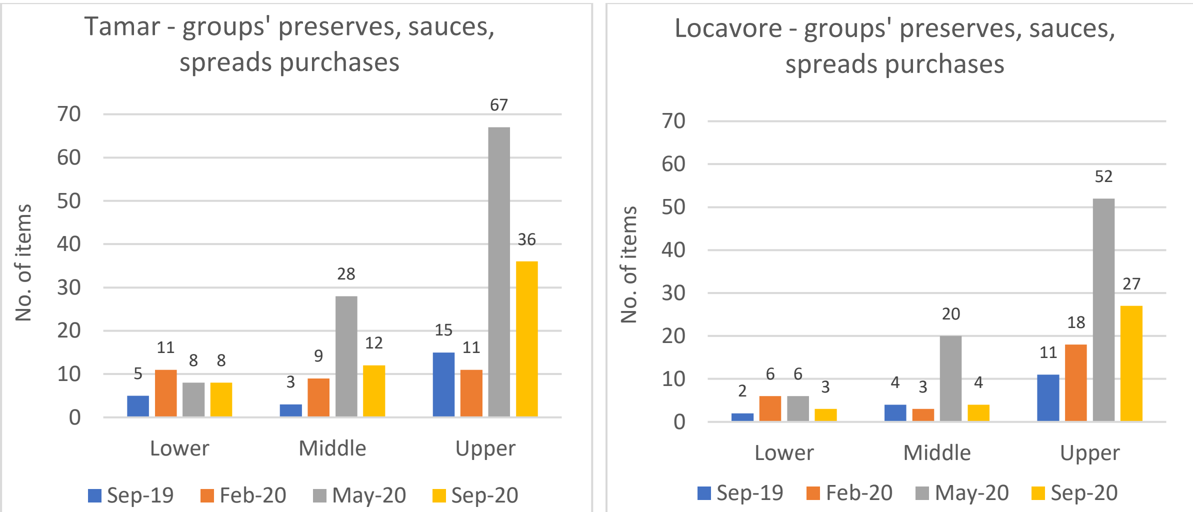


Figure 30, preserves, sauces, spreads - number of items bought each month by lower, middle, and upper expenditure customers

Figure 30 shows that sales of preserves, sauces and spreads increased for both of the upper expenditure groups and also the Tamar middle group. The May-20 spike was particularly pronounced for these groups.

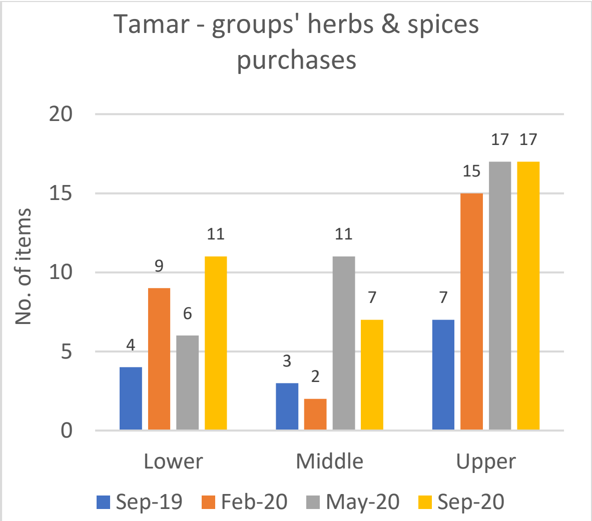


Figure 31, herbs & spices - number of items bought each month by lower, middle, and upper expenditure customers

Figure 31 shows that sales of herbs and spices gradually increased for all 3 Tamar groups.

Snacks

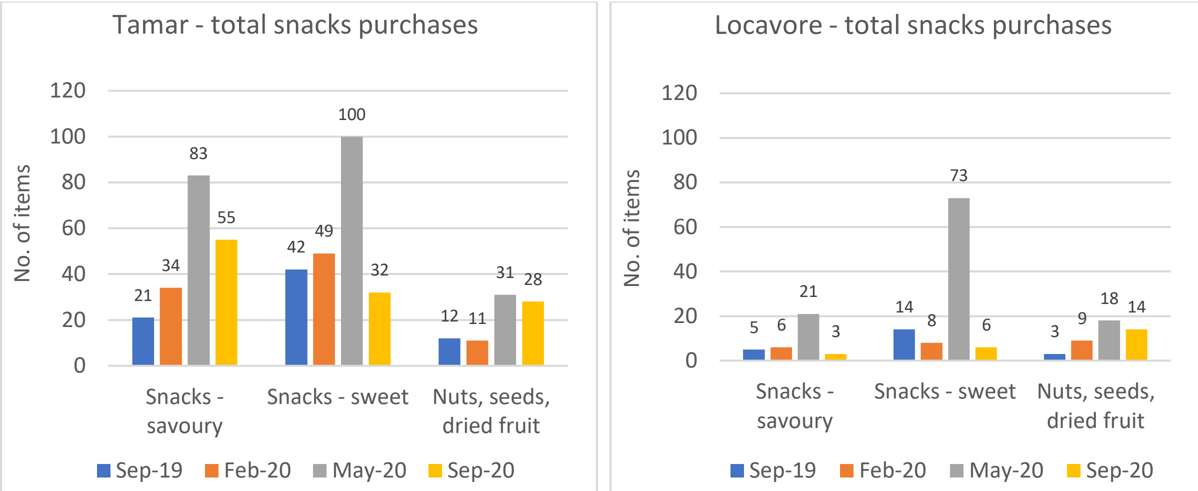


Figure 32, snacks - number of items bought each month by Tamar and Locavore customers

Figure 32 shows there was a considerable increase in sales of all types of snacks in May-20. Sales of nuts, seeds and dried fruit increased steadily over the 4 months. The two hubs differ in relative sales of sweet and savoury snacks and so it difficult to generalise from these graphs.

Snacks - savoury

Tamar sales were 162% higher in Sep-20 relative to Sep-19. Locavore sales were fairly consistent, perhaps reflecting the more limited selection. Tamar sells: corn cakes, rice cakes, lentil/quinoa chips, roasted fava beans, bombay mix. Locavore sells oat cakes only.

Snacks - sweet

Both hubs experienced a significant spike in May-20, but sales in Sep-20 were 24% lower for Tamar and 57% lower for Locavore, relative to Sep-19. Tamar sells: chocolate, sesame snaps, halva, biscuits, marshmallows. Locavore sells: chocolate, cocoa powder, waffles, sweet trio.

Nuts, seeds and dried fruit

Tamar sales doubled and Locavore sales quadrupled in Sep-20, relative to Sep-19. This includes: cashews, walnuts, sunflower seeds. Tamar also sells brazil nuts, dried mango, apricots, dates, cranberries, apple shreds, pumpkin seeds, chia seeds, flaxseed. Locavore also sells almonds.

<u>Groups' purchasing trends – snacks</u>

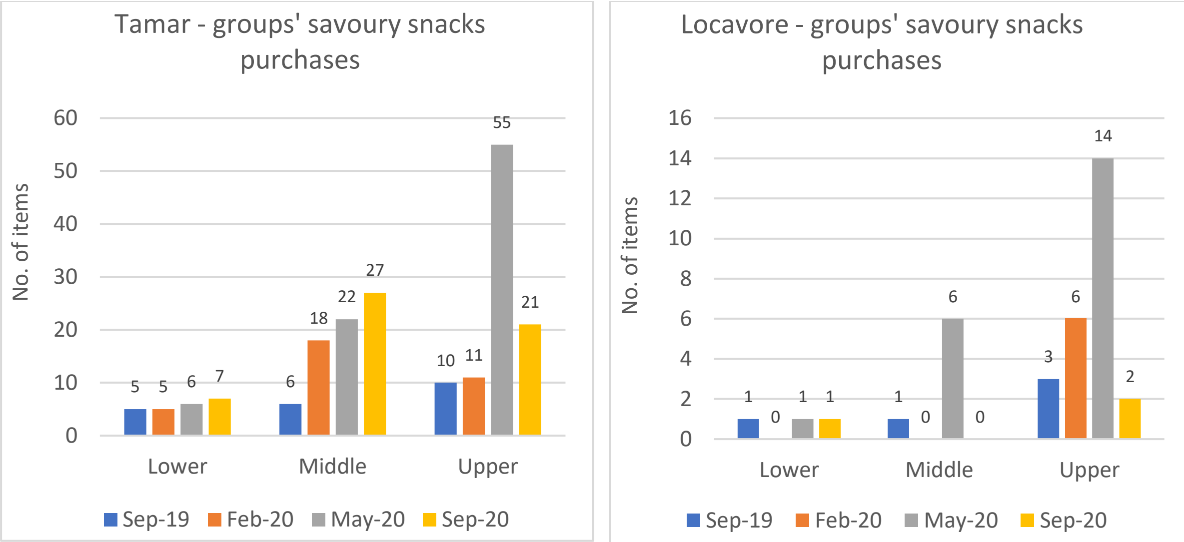


Figure 33, savoury snacks - number of items bought each month by lower, middle, and upper expenditure customers (note – different scales on y axis)

Figure 33 shows that sales of savoury snacks increased for all of the Tamar groups over the 4 months, whereas the Locavore groups remained consistent. Both upper groups experienced a significant spike in sales in May-20.

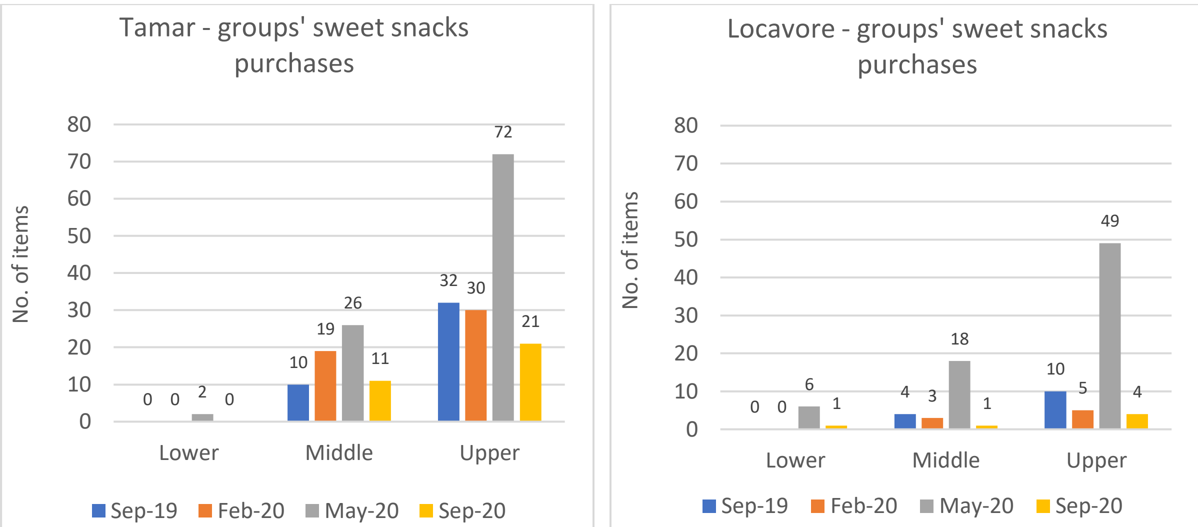


Figure 34, sweet snacks - number of items bought each month by lower, middle, and upper expenditure customers

No clear spending patterns can be identified in *Figure 34*, aside from the clear increase in demand in May-20.

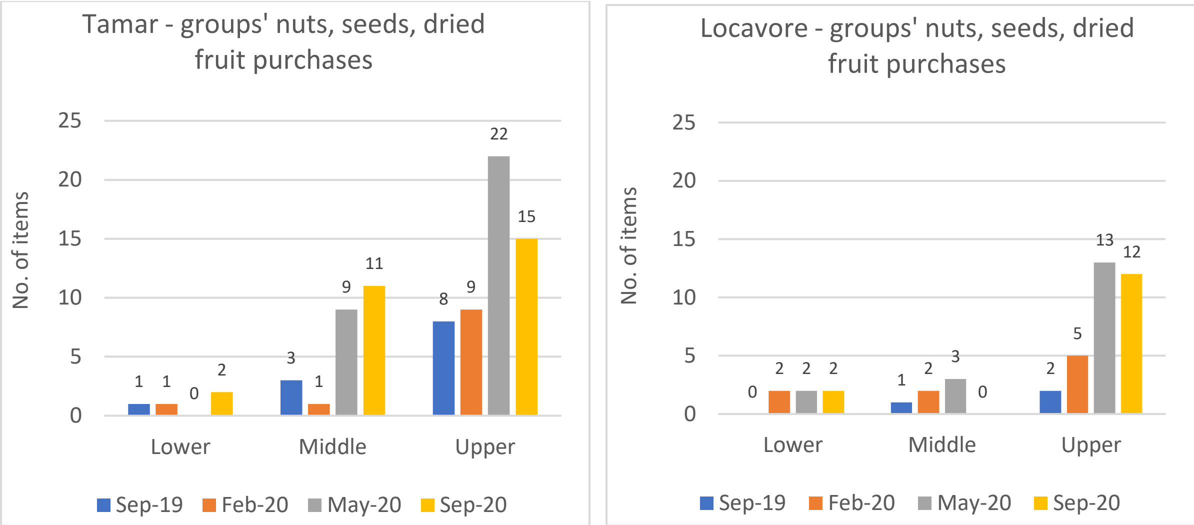


Figure 35, nuts, seeds, dried fruit - number of items bought each month by lower, middle, and upper expenditure customers

Figure 35 shows that sales of nuts, seeds and dried fruit increased for both of the upper expenditure groups as well as Tamar middle group. The remaining groups were fairly consistent in their purchasing behaviour.

Beverages

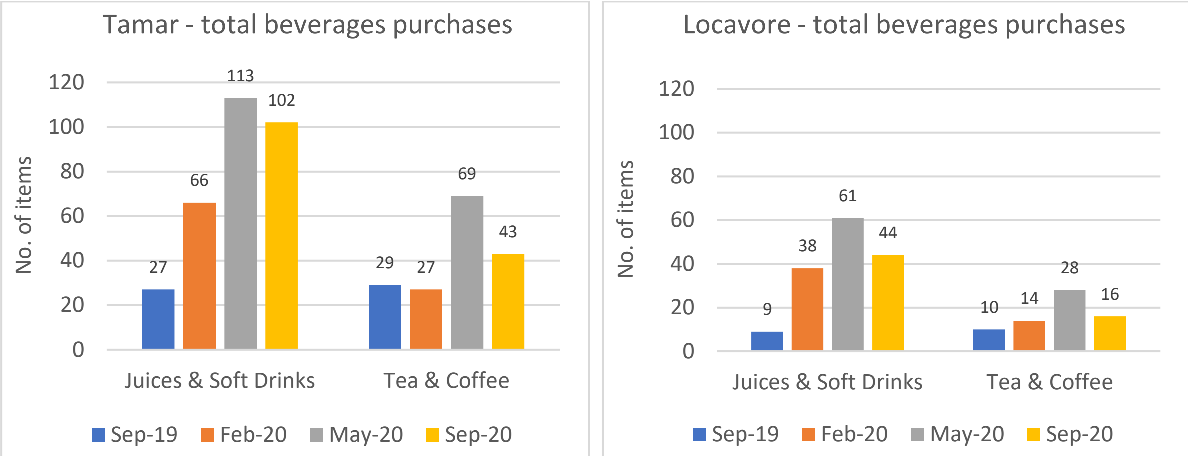


Figure 36, beverages - number of items bought each month by Tamar and Locavore customers

Figure 36 shows that sales in both drinks categories increased, particularly juices & soft drinks.

Juices & soft drinks

Demand for these products increased steadily - sales in Sep-20 were quadruple those of Sep-19 for both hubs. Tamar sales were approximately double those of Locavore’s. Milk substitutes such as oat, soya and almond are coded under ‘juices & soft drinks’.

Tea & Coffee

Both hubs experienced a spike in May-20. Sales in Sep-20 were 48% higher (Tamar) and 60% (Locavore) higher than in Sep-19. Tamar sales were more than double those of Locavore’s.

<u>Groups’ purchasing trends – beverages</u>

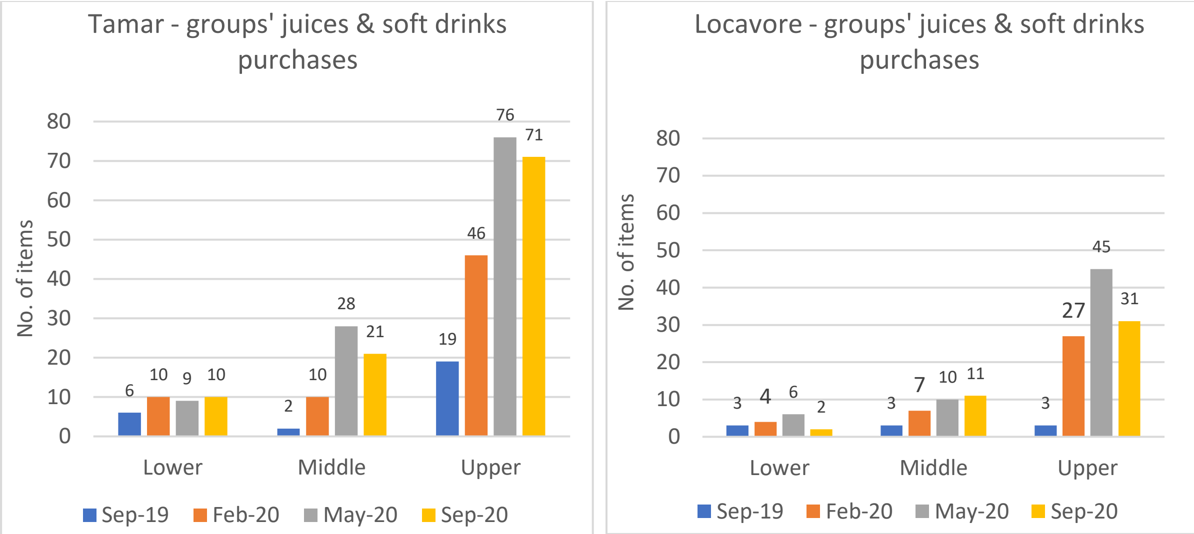


Figure 37, juices & soft drinks - number of items bought each month by lower, middle, and upper expenditure customers

Figure 37 shows that the middle and upper expenditure groups increased their purchases of juices and soft drinks over the 4 months. The lower groups remained constant.

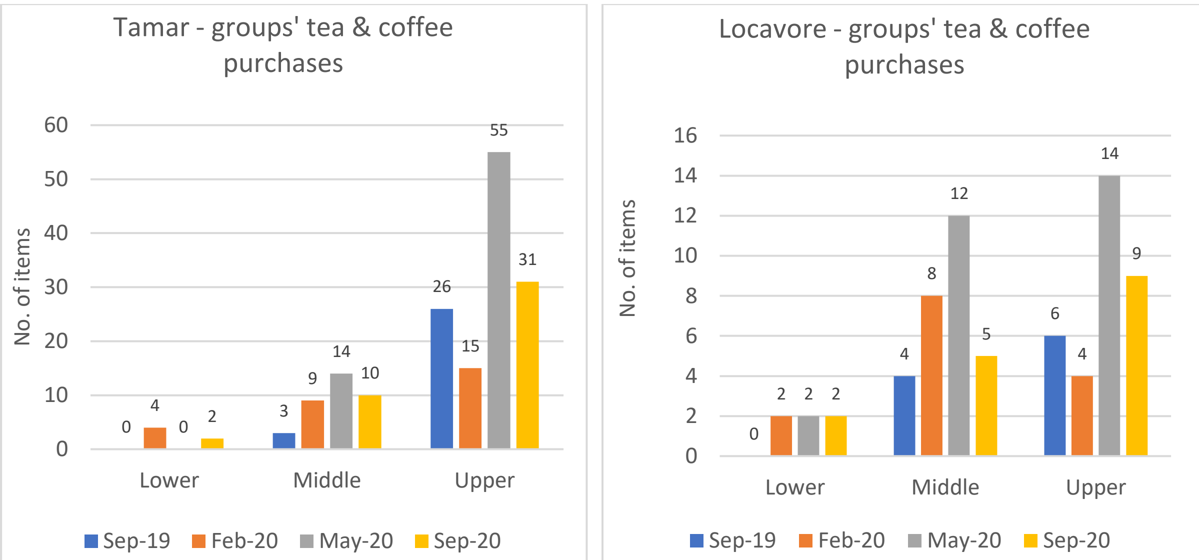


Figure 38, tea & coffee - number of items bought each month by lower, middle, and upper expenditure customers (note – different scales on y axis)

Figure 38 shows that both of the lower groups remained constant. Both middle groups increased tea & coffee purchases over the 4 months but sales decreased in Sep-20. Sales increased for both upper groups, aside from a dip in Feb-20.

Non-food items

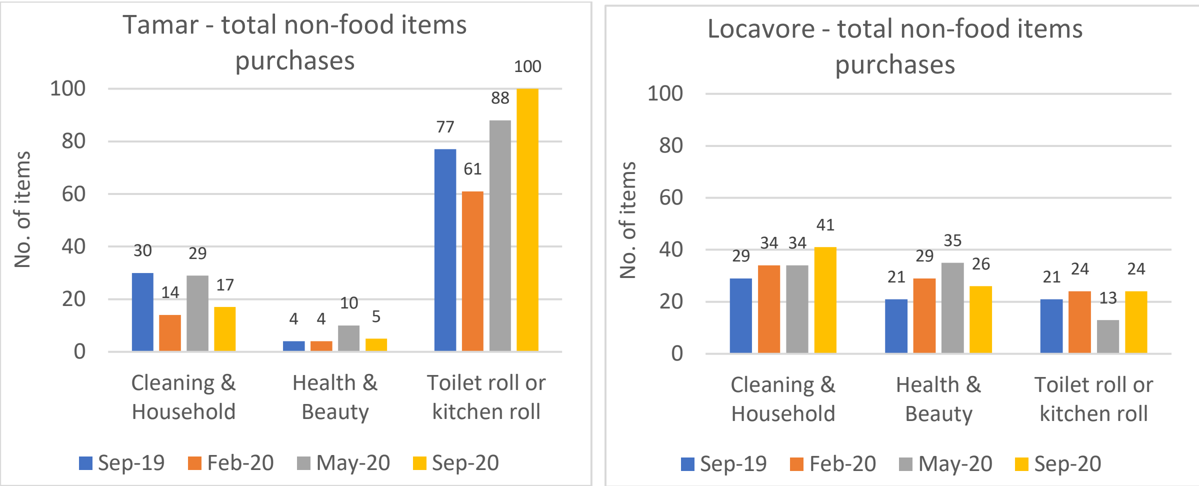


Figure 39, non-food items - number of items bought each month by Tamar and Locavore customers

Figure 39 shows that sales of non-food items were fairly consistent over the 4 months.

Cleaning & Household

Tamar sales fluctuated somewhat, but Locavore sales gradually increased over the 4 months. This includes: washing powder, dishwasher tablets, toilet roll, kitchen roll, cleaning products, caddy liners and refuse sacks. Tamar also sells logs, kindling and charcoal.

Health and Beauty

Aside from a spike in May-20 for both hubs, health and beauty sales were fairly consistent. This includes: soap, toothpaste, shampoo, conditioner, sanitary products. Tamar have a more limited range than Locavore.

Toilet & kitchen roll

Locavore sales have remained broadly consistent, but Tamar sales in Sep-20 were 30% higher than in Sep-19. Tamar sales were approximately 4 times those of Locavore's.

Groups' purchasing trends - non-food items

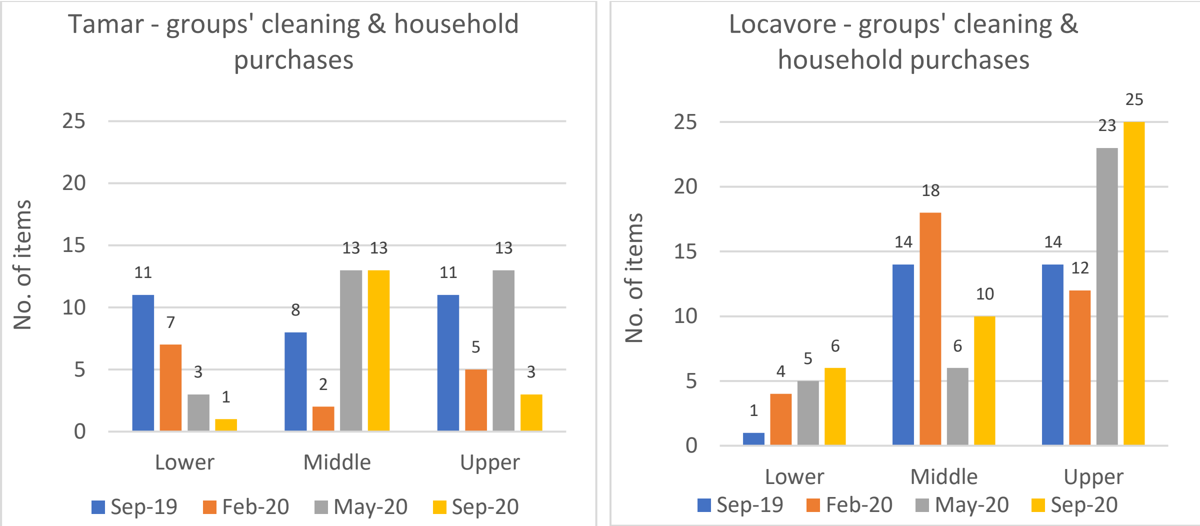


Figure 40, cleaning & household - number of items bought each month by lower, middle, and upper expenditure customers

The groups varied somewhat in their purchasing behaviour of cleaning & household items and so not clear findings emerge in *Figure 40.*

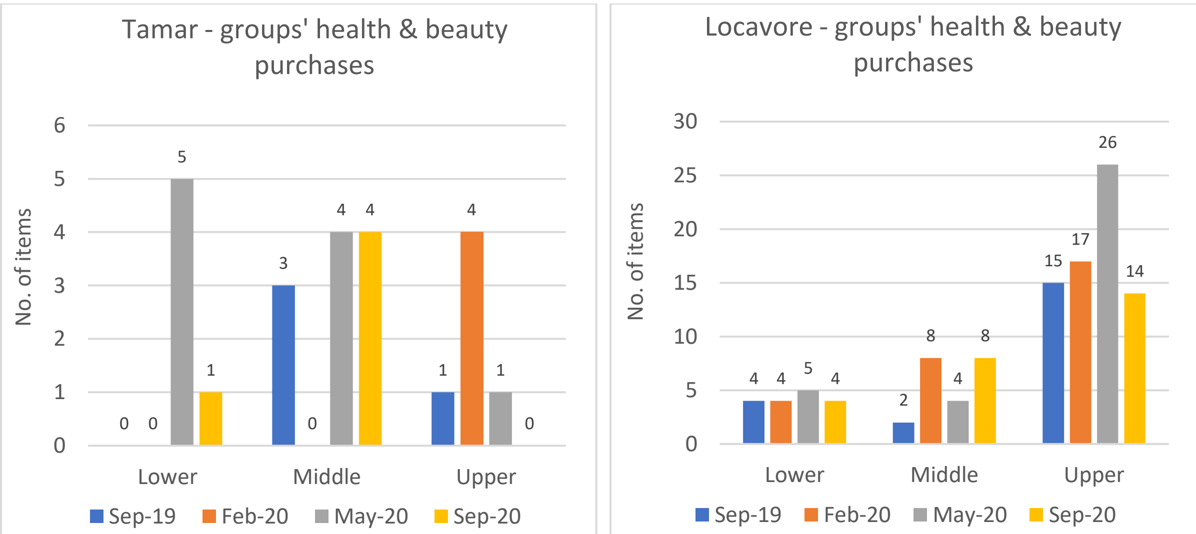


Figure 41, health & beauty - number of items bought each month by lower, middle, and upper expenditure customers (note – different scales on y axis)

Figure 41 shows that sales of health and beauty products were broadly consistent over the 4 months for all groups, albeit with some fluctuation.

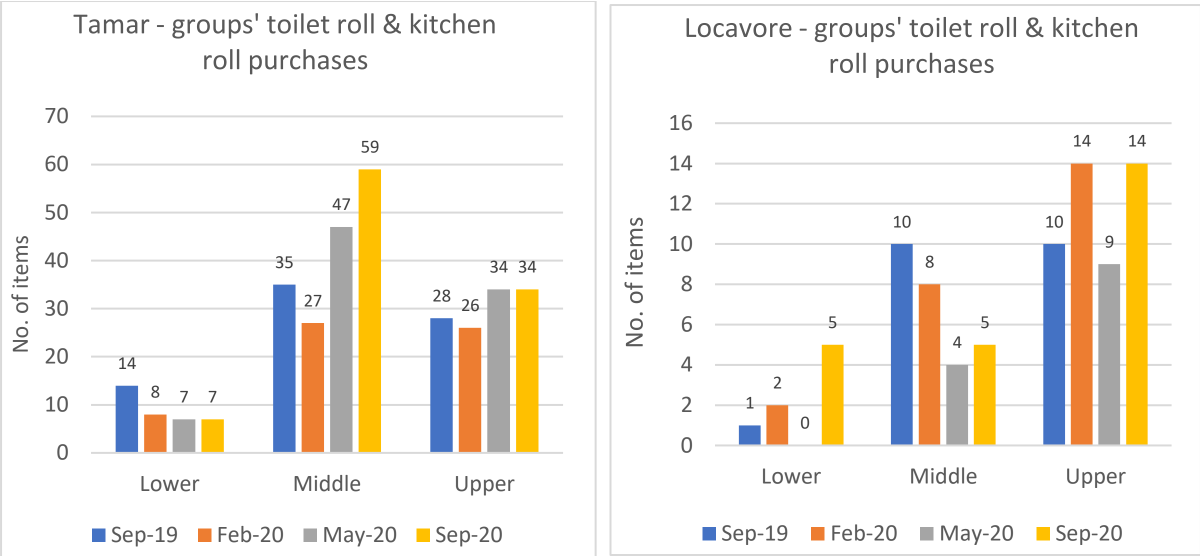


Figure 42, toilet roll & kitchen roll - number of items bought each month by lower, middle, and upper expenditure customers (note – different scales on y axis)

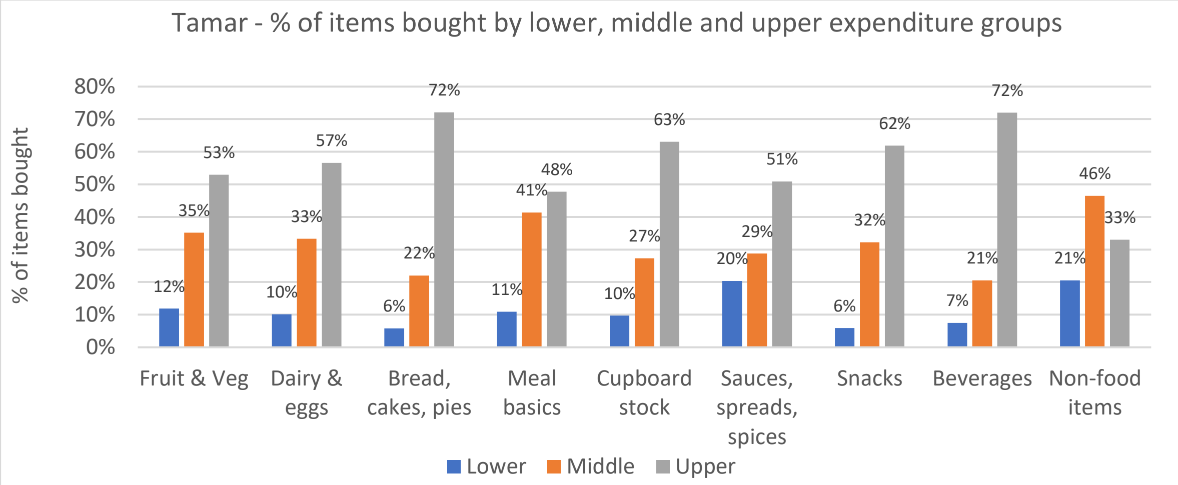
Figure 42 shows that sales of toilet roll and kitchen roll were consistent for both upper expenditure groups but increased for the Tamar middle group and Locavore lower group. Both middle groups bought proportionally more of these items.

<u>Excluded items</u>
The following items were excluded because they are outside the scope of this project: 'Flower, Plants & Garden' (both hubs); Tamar 'crafts' & 'event tickets'; Locavore 'Good food fund donation'.

3.2 Basket composition

This section compares the basket composition of the lower, middle and upper expenditure groups using the total number of items bought over the 4 months for 9 aggregated food categories.

Percentage of food hub purchases by expenditure groups



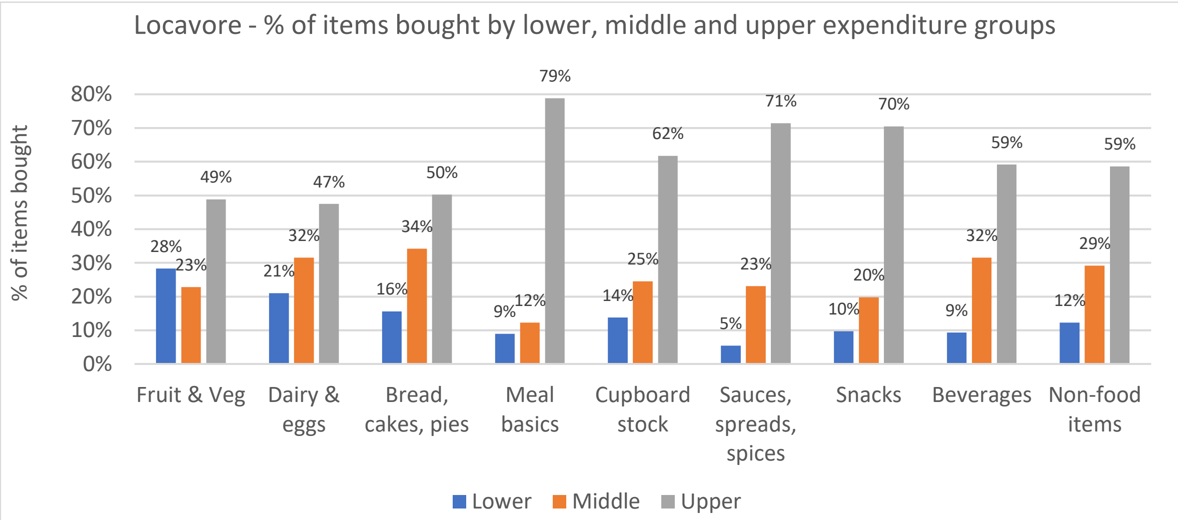


Figure 43, percentage of items bought by lower, middle and upper expenditure customers

Figure 43 shows that the lower expenditure group buys proportionally more fruit & veg, dairy & eggs, and non-food items, relative to the other two groups. The middle expenditure group also buys proportionally more non-food items relative to the upper group but is otherwise fairly consistent across the food categories, allowing for differences between the two hubs. The upper expenditure group buys proportionally more snacks and beverages, again allowing for differences between the hubs.

Basket composition of the lower, middle and upper expenditure groups

Lower expenditure group – basket composition

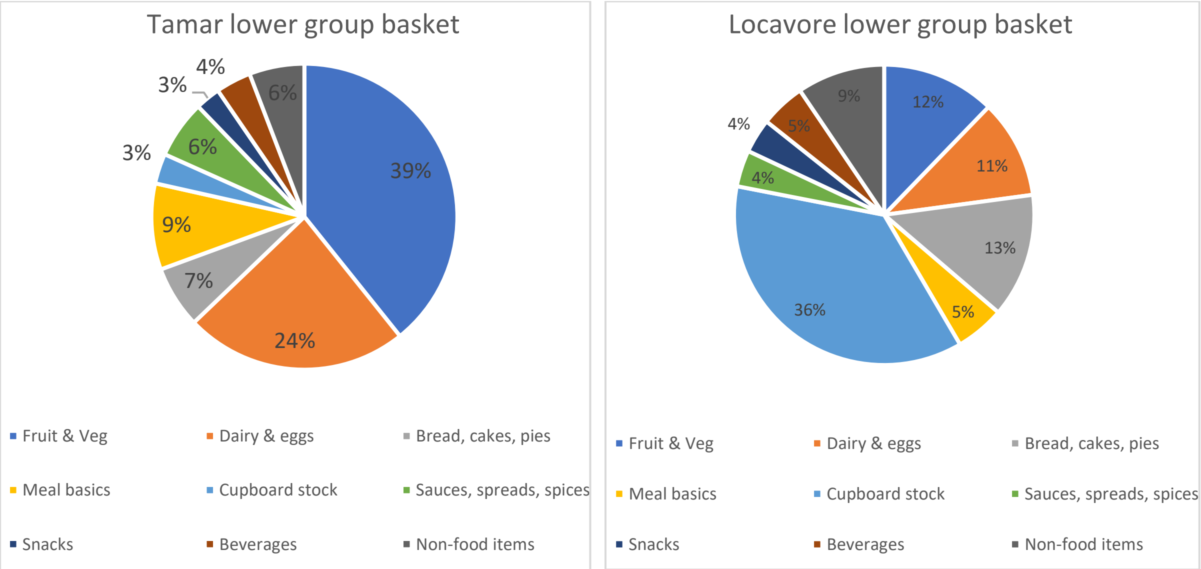


Figure 44, basket composition for Tamar and Locavore lower expenditure customers

Figure 44 shows the relative importance of fruit & veg and also dairy & eggs in the lower group basket. The comparatively lower percentage of fruit & veg in the Locavore basket is largely determined by veg boxes not being represented in this data (this is also reflected in the Locavore middle and upper expenditure baskets). Locavore lower group customers buy large quantities of tins & meal ingredients, which accounts for the high percentage of cupboard stock.

Middle expenditure group – basket composition

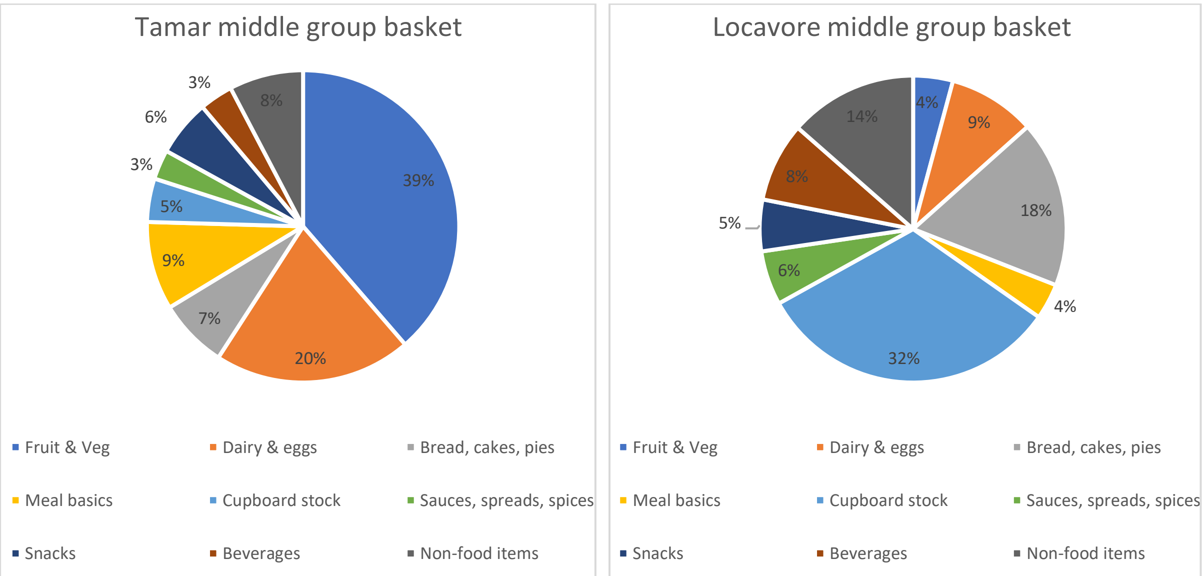


Figure 45, basket composition for Tamar and Locavore middle expenditure customers

Figure 45 shows that fruit & veg and dairy & eggs constitute a large proportion of the middle expenditure basket. As mentioned previously, non-food items account for a relatively high percentage of their basket. Locavore middle expenditure customers tend to buy large quantities of bread as well as tins & meal ingredients.

<u>Upper expenditure group – basket composition</u>

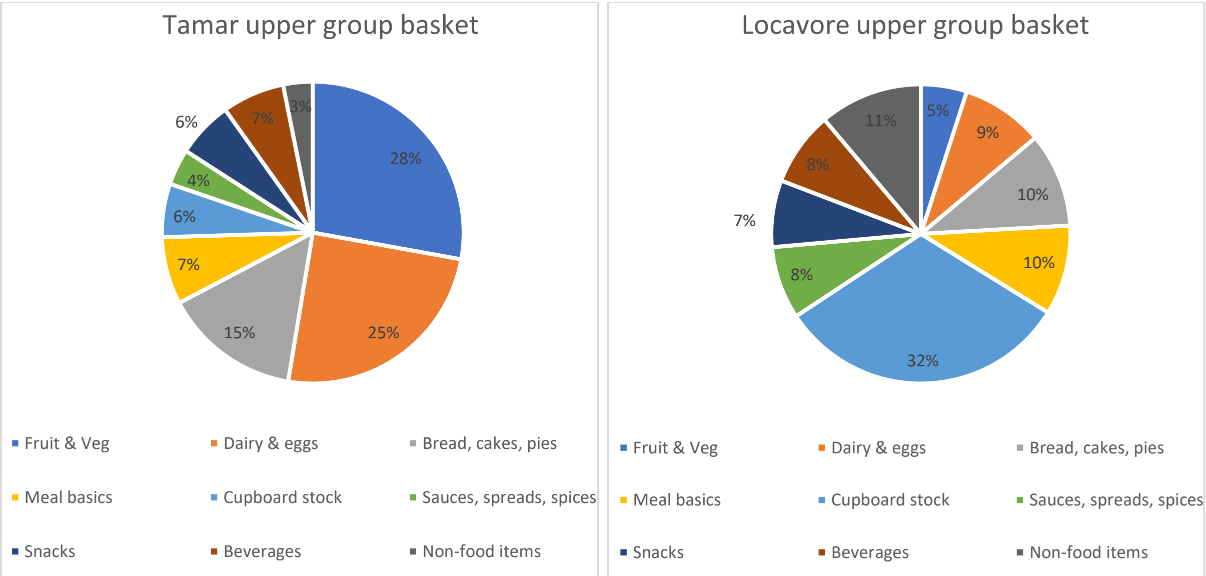


Figure 46, basket composition for Tamar and Locavore upper expenditure customers

Figure 46 shows that the upper expenditure basket is also characterised by fruit & veg, dairy & eggs and, in the case of Locavore customers, cupboard stock. However, the upper expenditure basket contains a larger percentage of meal basics, sauces & spreads, and beverages than the lower or middle expenditure baskets.

4.0 Comparing the food hub basket with the typical UK basket

This section compares the average OFN shopping basket with the average UK shopping basket. DEFRA's most recent *Family Food* survey, the 2018/19 edition (Office of National Statistics, 2020), was used to represent the typical UK basket.

Table 2 shows the weights/volumes of household purchases of food and drink, per person per week, for 49 of the categories used in *Family Food* (see 'F. Food basket 2018/19' column). The weights/volumes of comparable items bought from online food hubs are shown in the 'OFN basket' column. The 'OFN as a % of F. Food' column provides an indication of how much of a particular food the users buy from their local hub by showing the OFN purchase as a percentage of the average UK purchase. The blue cells indicate a medium proportion bought from food hubs (25-49% of the average UK purchase), the green cells indicate a large proportion (50-100%) and the orange cells indicate hub purchases which surpass the average UK weekly purchase (greater than 100%).

Assumptions used in the calculations

The weight was not stated for some items in the OFN data. If this information was not available on the OFN platform or the supplier's website, the weight was estimated using similar items sold by other suppliers as points of reference. For instance, a plain croissant sold through OFN was assumed to weigh the same as a plain croissant from another UK-based bakery. A full list of these references can be found in section 4.1.

The 'Assumption level' column refers to the magnitude of these assumptions: * = the weight was estimated for 1 or 2 items only within the category; ** = the weight was estimated for multiple items; *** = the weight was estimated for multiple items and the product description did not clearly define the contents or quantity, such as 'a *fruit bag*' or 'a *bunch* of golden beetroot'. Thus, the greater the number of *, the greater the level of uncertainty in estimating the weight. Assumptions were required for 11 of the 49 food categories.

Another important assumption is that the hub users represented in the OFN data live in households consisting of 2.4 people. This figure, 2.4 (CI ± 0.18), is the average number of people in hub user households from my 2019 survey and is consistent with the UK average household size of 2.37 (CI ± 0.01) (Office of National Statistics, 2019). This assumption was necessary to enable comparison between the OFN data, which is at the household level, with *Family Food* data which is at the person level.

Table 2, Comparing the OFN shopping basket with the average UK shopping basket

Broad category	Food categories	Unit of measur-ement	OFN basket	F.Food basket 2018/19	OFN as a % of F. Food	Tamar % of F. Food	Locavore % of F. Food	Assum-ption level
Fr. fruit & veg	Fresh veg	g	1023.0	1129.5	90.6	81.3	89.3	***
	Fresh fruit	g	193.0	787.0	24.5	18.2	29.9	***
Dairy & eggs	Butter	g	23.3	33.5	69.5	126.5	21.3	
	Non-dairy milk substit.	ml	43.4	68.9	63.0	31.0	90.1	
	Milk & cream	ml	480.7	1416.5	33.9	33.9	N/A	
	Cheese	g	30.5	108.4	28.2	52.5	7.7	
	Eggs	no.	0.5	2.1	21.9	37.2	9.1	
	Yoghurt	ml	20.0	187.6	10.6	17.2	5.1	
Bread, cakes, pies	Quiches	g	5.7	9.9	57.3	57.3	N/A	**
	Bread	g	108.5	521.0	20.8	31.8	11.6	**
	Pies & pasties	g	23.8	155.6	15.3	15.3	N/A	**
	Cakes, buns, pastries	g	17.5	150.8	11.6	15.5	8.4	**
Meal basics	Soya & novel proteins	g	15.1	9.1	166.5	108.3	215.6	
	Fish	g	25.7	75.6	34.0	69.7	3.9	***
	Meat	g	77.7	515.2	15.1	15.1	N/A	*
	Veg ready meals	g	7.1	76.2	9.3	9.3	N/A	**
Cupbo-ard stock	Vegetable purees	g	6.9	4.5	152.6	43.2	244.9	
	Dried veg	g	0.3	0.4	77.2	77.2	N/A	
	Flour	g	27.9	47.8	58.4	104.1	19.9	
	Stock & yeast	g	2.4	4.5	52.7	48.6	56.1	
	Oatmeal/oat products	g	13.5	25.7	52.4	70.7	37.0	
	Canned tomatoes	g	39.6	77.6	51.0	29.7	69.0	
	Cocoa	g	2.0	4.2	46.3	46.3	N/A	
	Canned pulses	g	48.6	106.0	45.8	20.6	67.1	
	Dried pulses	g	3.2	9.0	36.1	69.4	8.0	
	Salt	g	2.4	7.4	32.8	32.8	N/A	
	Canned veg	g	9.8	31.3	31.2	22.4	38.7	
	Other cereals	g	1.4	8.5	16.7	16.7	N/A	
	Pasta	g	12.2	77.7	15.7	14.3	16.9	
	Rice	g	9.8	69.8	14.1	23.1	6.5	
	Breakfast cereals	g	11.0	121.9	9.1	8.8	9.3	
	Sugar	g	4.9	63.2	7.8	11.6	4.5	
Sauces, spreads, oils	Peanut butter	g	3.5	6.2	56.8	82.7	34.9	
	Honey	g	2.8	7.9	35.5	26.7	42.9	
	Pickles	g	4.0	14.4	27.7	55.7	4.1	
	Jams	g	4.5	21.5	20.9	34.1	9.8	
	Vegetable & salad oils	ml	11.4	59.9	19.0	13.6	23.5	
	Other spreads	g	1.0	11.2	9.1	9.1	N/A	
	Sauces	g	3.0	112.9	2.7	5.5	0.3	
Snacks	Savoury snacks	g	8.1	23.5	34.2	34.2	N/A	
	Unsweetened biscuits	g	4.1	15.3	26.7	26.7	N/A	
	Nuts, seeds, dried fruit	g	6.1	49.0	12.5	19.4	6.7	
	Chocolate	g	3.9	38.4	10.0	13.1	7.5	
	Sweet biscuits	g	4.7	80.8	5.8	6.6	5.1	*
Bevera-ges	Coffee	g	5.5	24.5	22.4	36.5	10.6	
	Tea	g	4.1	20.3	20.0	34.1	8.1	*
	Pure fruit juices	ml	30.2	227.0	13.3	22.0	6.0	
	Mineral/spring waters	ml	34.3	503.9	6.8	6.8	N/A	
	Soft drinks	ml	27.4	840.3	3.3	3.3	N/A	

4.1 References for estimating weights

This section is a description of how item weights were estimated if the information was not available in the OFN data or on the suppliers' websites. Weights were estimated using similar items sold by other UK-based suppliers as points of reference. A number of relevant aspects were considered in this process: the price paid for the item relative to comparable items in the OFN data, or otherwise from alternative suppliers; a photo of the item on the supplier's website (if available) which could provide some indication of its weight; and the type of item if different varieties exist. This process ultimately entailed subjective decisions and so *Table 3* below and the 'Assumption level' column in *Table 2* are presented to make these decisions as transparent as possible.

Table 3, references for estimating item weights

Food category	**Reference sources**
Bread **	Column Bakehouse provided weights in the OFN data, but Pepper Street Bakers did not and no information was available on their website. A large loaf was therefore assumed to be 800g and a small loaf 400g, as per UK legislation on bread weights. Riverford also use these bread weights. Bread rolls and scones assumed 55g each; pack of 4 Knaekbroed assumed 150g; 4 x pizza dough balls assumed 1000g; Boule loaf assumed 400g. Sources: Pepper Street Bakers: http://pepperstreetbreads.yolasite.com/breads.php ; UK bread legislation: https://www.fob.uk.com/about-the-bread-industry/how-bread-is-made/legislation ; Bakery / Riverford ; Bun weights: https://www.nutracheck.co.uk/CaloriesIn/Product/Search?desc=bread%20roll&page=0
Cakes, buns, pastries **	Vals' cakes provided weights in the OFN data, but Pepper Street Bakers did not. Loaf cakes assumed 400g; filled pastries, swirls & muffins assumed 100g; scones & buns assumed 55g each; unfilled pastries assumed 70g; large torte assumed 1000g; flapjack assumed 150g; sourdough almond croissants assumed 100g. Sources: Pastry & scone weights: https://www.delifrance.com/uk/products/viennoiserie/croissant.html ; https://goldstandardbaking.com/croissant-varieties/
Fish ***	All tinned fish and some of the fresh fish weights were provided in the OFN data. However, no information was provided on Pengelly's website for 'catch of the day' items. One white fish portion assumed 140g, taking into account the type of fish and the amount paid relative to supermarkets. Salmon fillets assumed 120g; Scallops assumed 100g; sardines assumed 200g. Sources: https://pengellys.co.uk/ ; https://kuuleats.com/r/92/pengellys-famous-fishmongers-east-looe/o ; Tesco Finest Skinless & Boneless Cod Loin - Tesco Groceries ; Chilled Fish & Seafood - Tesco Groceries
Fresh fruit	Most fruit weights were stated in the Tamar data, whereas the Locavore data included weights for Sep-20 but not for Sep-19. The Locavore Sep-20 range was very

***	limited and so Riverford was used as a reference because they sell imported fruits (Tamar do not). The 'what things weigh' website was used as a reference for the average weight of particular fruits. Grapes assumed 150g (based on the low price paid); 1 x apple or pear assumed 180g. Locavore customers are assumed to buy a small fruit bag weighing 986g with each OFN order they place, as per their business model (see explanation in 'Fresh veg', below). The weight of a Locavore small fruit bag weight was assumed using the weight of a Locavore large fruit bag (2960g) on 18th Jan 2021 as a guide, which was then scaled to a small bag according to the relative price. A Tamar small fruit bag was assumed 986g to match a Locavore small fruit bag as they are comparable on price. Sources: Fruit weights: https://weightofstuff.com/average-weight-of-all-fruits-and-vegetables/#:~:text=Average%20Weights%20of%20Vegetables%20%28A%20to%20Z%29%20,%205%20g%20%2024%20more%20rows%20 ; http://www.fromkarenskitchen.com/tips/produce_weight_yield_chart.php: ; lemons weight: https://whatthingsweigh.com/how-much-does-a-lemon-weigh/ ; apples weight https://whatthingsweigh.com/how-much-does-an-apple-weigh/
Fresh veg ***	Fresh veg was by far the most diverse of the food categories and many of the weights were provided in the data. For those items where weights were not stated, two websites in particular were used as references: 'what things weigh' for the average weight of individual vegetables, and Riverford which sells comparable items and usually states the weight. Cabbage assumed 907g, beetroot 113g, cucumber 250g, elephant garlic 450g, chervil 25g a bunch (based on low price paid), golden beetroot 600g (comparable with other beetroots sold by OFN), 1 leek 300g, 2 x little gem lettuce 250g, lettuce 163g, small pumpkin 1500g, winter squash 1200g, small marrow 800g, cauliflower 500g, swede 500g, bunch of radishes 150g, spring greens 400g per head, small artichokes 70g, aubergine 600g, fennel bulb 500g, 2 x bulls horn pepper 340g, chilli pepper 50g, pointed cabbage 600g, roll of collard greens 300g, butternut squash 1100g, kohlrabi assumed 150g, punnet of cherry tomatoes 100g (based on low price paid), courgettes 100g (based on low price paid), pea shoots or micro basil in punnet 50g. The weights of veg boxes/bags were assumed using the weight of a Locavore extra large veg box (8825g) on 18th Jan 2021 as a guide, and then scaled according to the relative price of a particular box or bag. A Locavore standard veg box assumed 4412g; a Tamar veg bag without potatoes assumed 1694g; a Tamar veg bag with potatoes assumed 2034g; a Tamar organic veg box assumed 5983g. Every Locavore order is assumed to incorporate one standard veg box, as per their business model where OFN orders constitute 'add-ons' to their existing veg box order. Sources: Fruit & veg weights: https://weightofstuff.com/average-weight-of-all-fruits-and-vegetables/#:~:text=Average%20Weights%20of%20Vegetables%20%28A%20to%20Z%29%20,%205%20g%20%2024%20more%20rows%20 ; http://www.fromkarenskitchen.com/tips/produce_weight_yield_chart.php: ; Elephant garlic: https://www.specialtyproduce.com/produce/Elephant_Garlic_850.php ; Lettuce:

	https://hannaone.com/Recipe/weightlettuce.html ; Aubergine: https://www.brandeastfortune.co.uk/product/aubergine ; Fennel: https://www.howmuchisin.com/produce_converters/fennel ; Kohlrabi : https://www.nutrition-and-you.com/kohlrabi.html ; Vegetables / Riverford
Meat *	Most meat weights were provided in the OFN data. A few of the sausage orders were assumed 500g to match other Tamar sausages orders. Some lamb orders were matched by relative price to lamb orders where the weight was provided. Burgers were estimated using the supermarket equivalent. A whole chicken was assumed to be very large - 2200g, based on the high price paid relative to supermarkets. Sources: Tesco's https://www.tesco.com/groceries/en-GB/products/256278098 ; https://www.tesco.com/groceries/en-GB/search?query=burgers
Pies & pasties **	Helluva Pasties, Callington, is one of Tamar's suppliers and its item weights were available in the OFN data. Items from other Tamar pie & pasty suppliers were matched to Helluva. The weights of cottage pie and beef lasagne were assumed the same as comparable items from supermarkets. Sources: Helluva Pasties: https://www.helluvapasties.co.uk/shop/ ; http://www.langmansrestaurant.co.uk/the-pasty-shop/ ; Tesco's: https://www.tesco.com/groceries/en-GB/search?query=cottage%20pie ; https://www.tesco.com/groceries/en-GB/search?query=beef%20lasagne
Quiche **	Quiche was assumed 400g, as per comparable items from supermarkets. Sources: Tesco's https://www.tesco.com/groceries/en-GB/search?query=quiche
Sweet biscuits *	Most weights were provided in the OFN data. Cookies were assumed 200g, as per comparable items from supermarkets. Sources: https://www.tesco.com/groceries/en-GB/products/276132127
Tea *	No brand information was provided in the OFN data except for Tick Tock. Weight was assumed the same as comparable items from supermarkets, taking into account the number of T-bags in the box. Sources: Tesco's https://www.tesco.com/groceries/en-GB/search?query=tea%20bags
Veg ready meals **	Veg pasties were assumed 310g, as per Helluva Pasties. Veg tarte was assumed 450g and vegetable pies were assumed 568g, as per comparable items from supermarkets. Sources: Helluva Pasties: https://www.helluvapasties.co.uk/shop/ ; Tesco's: https://www.tesco.com/groceries/en-GB/search?query=vegetable%20pie

5.0 References

Office of National Statistics, 2019. *Families and households in the UK: 2019* [online]. ONS. Available at: Families and households in the UK - Office for National Statistics (ons.gov.uk) [Accessed 12.01.21]

Office of National Statistics, 2020. *Family Food 2018/19* [online]. DEFRA. Available at: Family Food 2018/19 - GOV.UK (www.gov.uk) [Accessed 12.01.21]